

APPENDIX E

HEALTH AND SAFETY PLAN

**BALLARD, HENRY, AND ENOCH VALLEY MINES
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY**

HEALTH AND SAFETY PLAN

**DRAFT
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ACRONYMS AND ABBREVIATIONS

ACGIH	American Congress of Governmental Industrial Hygienists
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
CPR	Cardiopulmonary Resuscitation
EPA	Environmental Protection Agency
ft	Feet
FTL	Field Team Leader
HASP	Health and Safety Plan
IDLH	Immediately Dangerous to Life or Health
IMASC	Idaho Mining Association Selenium Committee
JRA	Pre-Job Risk Analysis
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NPS	National Parks Service
OSHA	Occupational Safety and Health Administration
OSO	On-Site Safety Officer
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
PSO	Project Safety Officer
REL	Recommended Exposure Limit
RI/FS	Remedial Investigation and Feasibility Study
SOP	Standard Operating Procedure
TLV	Threshold Limit Value
TWA	Time-Weighted Average
yds	Yards

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been prepared to establish the responsibilities, requirements, and procedures for protecting MWH personnel during the Enoch Valley, Henry, and Ballard Mines Remedial Investigation and Feasibility Study (RI/FS). This HASP has been prepared to provide assigned field personnel with a safe working environment as the investigation proceeds. Specifically, the HASP has been developed to minimize the potential for job-related injuries and illnesses, and to prevent job-related injuries and illnesses from occurring. Where this HASP addresses safe practices for various specific construction activities, this information is provided solely as directives or guidelines for protecting MWH employees and establishing minimum requirements for MWH subcontractors. Any questions over implementation of this plan should be addressed to the Project Safety Officer or the MWH Regional EH&S Manager.

A fundamental principle of industrial safety and loss prevention is that most accidents that cause injury, illness, or property damage are preventable. Investigations of the causes of industrial accidents and illnesses have demonstrated that most injuries or illnesses are the result of unsafe acts or conditions. Thus, minimizing industrial accidents and illnesses can be accomplished by recognizing, evaluating, and controlling unsafe acts and conditions.

Employees are required to employ safe work practices and comply with applicable MWH requirements, as well as the applicable requirements of the agencies responsible for regulating industrial health and safety, including the OSHA and MSHA. Furthermore, P4 Production employs its own practice of training every contractor that works on the Soda Springs Phosphate Mine site to ensure that everyone on the site is knowledgeable and aware of the hazards that exist. This process and the applicable documents are discussed where applicable in this HASP.

2.0 SITE HEALTH AND SAFETY ANALYSIS

This section of the HASP identifies activity-specific hazards that may be encountered at project sites during the course of planned field activities, as well as methods that will be employed to control exposure to these hazards. The field activities discussed herein include the potential collection of soil, sediment, vegetation, surface and groundwater samples, well installation supervision, and direct push well installation supervision. Activity locations will generally be either on or adjacent to Ballard, Henry, or Enoch Valley Mines. Exceptions may include regional investigations at some distance from the Mines.

Some of the selected sample sites are readily accessible by vehicle; others, however, are not directly accessible by vehicle, and may require travel on foot. Health and safety issues that are associated with these sites requiring extensive foot travel will be addressed herein.

Specific activities that may be involved in the investigation are listed in Appendix A, *Activity Hazard Analysis*. Appendix A details the hazards that may be associated with these activities, and recommended controls to minimize risk to MWH and subcontractor field personnel. Appendix B, *MWH EH&S Procedure No. 811, Drilling Safety*, addresses, in detail, hazards and safety concerns related to well installation and drilling supervision. Recognized specific chemical, radiological, physical, and biological hazards that may be encountered during field activities are also discussed in the following paragraphs.

Although phosphate ore bodies are known to have slightly elevated concentrations of uranium-238 (^{238}U), radiation has not been identified as a hazard that is likely to be associated with this project and monitoring for ionizing radiation will not be undertaken during the investigation. Additional safety practices more generally applicable to field activities are summarized in the subsequent sections of this plan.

2.1 POTENTIAL CHEMICALS HAZARDS

The hazards that may be associated with chemical contaminants can be assessed through comparison of measured or estimated personnel exposures to established occupational exposure limits. Permissible exposure limits (PELs) are established by the Occupational Safety and Health Administration (OSHA), while recommended exposure limits (RELs) are established by the National Institute for Occupational Safety and Health (NIOSH). Immediately dangerous to life and health (IDLH) concentrations are also established by NIOSH. Threshold limit values (TLVs) and time-weighted averages (TWAs) are established by the American Conference of Governmental Industrial Hygienists (ACGIH). PELs may be expressed as an 8-hour TWA or as a ceiling limit. Ceiling limits may not be exceeded at any time, and are enforceable by law. RELs are published guidelines that set employee exposure limits for airborne contaminants. RELs are expressed as a TWA or ceiling limit. The ACGIH TLV/TWA is the airborne concentration of a substance to which nearly any worker may be repeatedly exposed 8 hours per day, 40 hours per week, without experiencing adverse health effects. For some substances, the overall exposure to a substance is aggravated by contact with skin, mucous membranes, or the eyes. Other substances have a ceiling value that may not be exceeded during any part of the

workday. An IDLH concentration is the maximum airborne concentration of a substance that one could escape within 30 minutes without impairing symptoms or irreversible health effects. It is not anticipated that MWH personnel will be exposed to airborne contaminants above regulatory limits if prudent work practices, including dust control, are employed during the sampling event(s).

Extensive sampling has been undertaken in many areas of the Southeast Idaho Phosphate Resource Area to date by MWH and P4 Production, the IMA companies, and regulatory agencies. Based on area history, the events that prompted this investigation, and sampling to date, naturally-occurring selenium, cadmium, molybdenum, and other trace elements in the phosphate ore body could potentially pose a hazard to sub-populations. Empirical evidence and evaluation of existing data indicate that there has been, and is no, reasonable possibility for health hazards to local residents. Such residents (who are assumed to consume exposed fish, game, and cattle) have high degrees of exposure—speaking relatively, rather than absolutely. Exposures to employees implementing the scope of work covered by this plan are substantially less and thus, there is no reasonable possibility for employee exposure to safety or health hazards associated with these substances. Table 2-1 presents occupational exposure limits and toxicological information for selenium and for other metals that could be present at the sampling sites.

In addition to the naturally occurring elements discussed above, field personnel will use a variety of chemical standards in the calibration of their field instruments. These include solutions for calibrating: conductivity (potassium chloride), pH-4, pH-10, oxidation-reduction potential or ORP (potassium chloride, potassium ferrocyanide trihydrate, potassium ferricyanide), and a calibration check (Quick Cal™) solution (potassium dihydrogen phosphate, potassium chloride, sodium hydroxide, potassium ferrocyanide trihydrate, potassium ferricyanide). These chemicals are generally non-toxic and non-corrosive, but nitrile gloves and safety glasses should still be worn when handling. All MSDSs can be found in Appendix C.

Field Personnel also are in contact with small (but still dangerous) amounts of nitric acid used for sample preservation in water samples. Nitrile gloves and safety glasses should ALWAYS be used, and extreme care should always be taken when opening sample bottles; at high altitudes, bottles can become pressurized and acid can be released violently when opened. Nitric acid is an extremely corrosive oxidizer and will cause severe burns to skin and even clothing. Fumes are toxic and employees should therefore avoid breathing in fumes directly.

Field measurements of nitrite and ferrous iron in groundwater samples require the use of chemical reagent packets. Nitrite reagents are composed of a variety of compounds, predominantly potassium phosphate, and ferrous iron reagents are composed of 1,10 – phenanthroline and sodium bicarbonate. Nitrile gloves and safety glasses must be donned while using either reagent.

When field equipment must be used that is not station-dedicated (i.e. the use of trowels and scissors during soil and vegetation sampling), equipment must be decontaminated with a water-Alconox™ detergent solution between uses. No safety hazards are anticipated when handling the solution, but when concentrated Alconox™ powder is handled, nitrile gloves and safety glasses should be used and caution should be taken.

During well installation, there is the possibility of hydraulic fluid/oil leaks or spills from drill rigs. MWH personnel must ensure that drilling contractors are capable of containing the release in such an event. Drillers often use liquid “drilling detergent” to increase the viscosity of the drilling fluid (typically water). Drillers typically use DawnTM liquid dishwashing soap. While this is a relatively safe household item, safety glasses should be worn in the case of splatter.

2.2 RADIOLOGICAL HAZARDS

Phosphate ore in the southeast Idaho Phosphate Resource Area has slightly elevated levels of naturally occurring radionuclides, i.e., isotopes that produce ionizing radiation. Most notable is the isotope ²³⁸U. Natural background in soils varies significantly throughout the United States but generally ranges from 2 to 10 picocuries per gram (pCi/g), whereas phosphate ore contains 23 to 28 pCi/g of ²³⁸U. In addition, the ²³⁸U found in ore is in equilibrium with all of its decay daughters, including radium, radon, and polonium (i.e., all of the decay daughters would be expected to range from 23 to 28 picocuries per gram in the ore as well). This level of radiological activity does not pose a threat to persons on a mine site. However, certain common sense precautions are worth noting. These precautions are similar to those used to prevent exposure to other trace elements in media being sampled, i.e., avoid inhalation and ingestion. The precautions include:

- Avoid breathing dusts;
- Do not eat and drink in dusty areas;
- Use proper hygiene techniques such as washing your hands prior to eating;
- Change clothing daily if clothing becomes soiled with ore. Note that clothing can be washed normally to remove the ore; and,
- If using a respirator, ensure that you keep the respirator clean.

2.3 PHYSICAL HAZARDS

Physical hazards associated with active mine sites as well as those associated with persons working out-of-doors in a mountainous terrain probably pose the greatest threat to field personnel on this project. The physical hazards that may be encountered will vary according to the type of site being investigated. Active mines pose hazards that are specific to mine operations, including the operation of heavy equipment, blasting, and the possibility of mine wall collapse. Large mine haul trucks may travel at relatively high rates of speed and pose a unique traffic threat to anyone traveling on mine haul roads. Railroad trains are also used at mines to haul ore to processing plants and pose railroad crossing hazards. Field personnel working on or around mine traffic areas should be especially mindful of mine-related traffic and mine-specific traffic rules.

Mine wall collapse could also occur at inactive mine sites. At some of the older mines, driving or walking near a high wall may pose a significant hazard as well. Field personnel are required to wear hardhats and safety glasses whenever they are in a mine pit, near a high wall, or any other situation in which an overhead hazard may exist. Field personnel must be alert and aware of their surroundings. Therefore, prior to entering an inactive mine site, MWH personnel must be cautious and aware of any potential instability that could lead to rock slides, the collapse of

high walls, and other physical hazards. MWH personnel will also be acquainted with the signs of instability that could lead to rock slides, the collapse of high walls, and similar hazards.

At other sites, hazards associated with collecting samples are likely to be minimal. Traveling by foot through, or collecting samples in, pasture land, cropland, or forest, possible hazards may be largely limited to slipping, tripping, and falling. It is important that proper footwear is always worn, and that care and common sense is always used while walking to and from stations. Safety glasses are also required while collecting soil and vegetation samples due to the possibility of dust or other debris blowing into the eye. While hiking to and from a sample location, it is also a good idea to wear eye protection to protect from tree branches and other eye-level hazards. Stream sampling can pose risks associated with loss of balance, including head and limb injuries, scrapes, hypothermia, and drowning. Personnel will need to use good judgment to determine whether it is safe to enter a body of water. In particular, while sampling from streams or rivers, field personnel should be aware of hazards that may be created by high or turbulent water, including being swept out by the current. Additionally, field personnel should be aware of hazards that may be created by stepping in deep, soft sediments, or floating debris.

Travel to remote areas engenders additional hazards specific to the method of travel. Hazards associated with foot travel include muscle strains and sprains, dehydration, heat or cold stress, and slips, trips, and falls. If a sample location cannot be reached by vehicle, and a significant hike is required, precautions must be taken to ensure that field personnel are properly protected from the weather, whether it is heat stress or cold stress. Hazards associated with vehicle transport include flat tires, getting the vehicle stuck, and other miscellaneous vehicle malfunctions. It is essential that both the vehicle operator and vehicle passengers are cautious and observant of on/off road obstacles and dangers. Operator and passengers should also carry a 2-way radio and cell phone or satellite phone (if available) with them at all times, and know how to change a flat tire on the vehicle.

Travel in remote areas can also pose hazards that are best countered by acquiring a knowledge of wilderness safety, awareness of methods for handling contact with animals, and by safely operating equipment. Specific hazards associated with travel in remote areas are listed in Appendix A, *Activity Hazard Analysis*, together with recommended practices and procedures to minimize risks to MWH and subcontractor field personnel. Table 2-2, *Ten Essentials for Wilderness Travel* lists the ten essential items that field personnel should always have with them when working in remote areas.

Overseeing well installation presents a unique set of physical hazards due mainly to the heavy machinery used. Hearing protection is essential as well as hard hats and safety glasses to protect from flying debris caused by drilling. Long hours in one location on hot, sunny days present a challenge in staying cool while donning required PPE. Sunscreen, light colored clothing, and replenishing fluids are essential. Taking refuge inside of a vehicle may be acceptable if the drilling supervision task is not compromised. Furthermore, hands should be kept away from all moving parts and care should be taken when walking around drilling sites to avoid slips, trips, and falls.

TABLE 2-1
OCCUPATIONAL EXPOSURE LIMITS AND TOXICOLOGICAL PROPERTIES FOR
POTENTIAL CHEMICAL EXPOSURE HAZARDS

Contaminant	OSHA PEL (mg/m ³)	NIOSH REL (mg/m ³)	ACGIH TLV (mg/m ³)	ACGIH/OSHA STEL	OSHA/NIOSH IDLH (mg/m ³)	IP (eV)	Route of Exposure	Symptoms of Exposure
Cadmium	0.005 (see 29 CFR 1910.1027)	Ca (lowest feasible)	0.01 & 0.002 (respirable fraction)	NA	50	NA	INH, ING	Pulmonary edema, dyspnea, cough, chest tightness, pain, headache; chills, muscle aches; nausea, vomiting, diarrhea; emphysema, mild anemia
Fluoride, as F	2.5	2.5	2.5	NA	500	NA	INH, ING, CON	Eye irritation, respiratory system, nausea, abdominal pain, diarrhea, excessive saliva, thirst, and sweat.
Molybdenum (soluble compounds as Mo)	5	NA	0.5 (respirable fraction)	NA	NE	NA	INH, ING	In animals: irritant to eyes, nose and throat; anorexia; diarrhea; weight loss; listlessness; liver and kidney damage.
Nickel (soluble compounds as Ni)	1	0.015 (Ca)	0.1	NA	10 (Ca)	NA	INH, ING, CON	Headache, vertigo; nausea, vomiting, epigastric pain, substernal pain; cough, hyperpnea; cyanosis; weakness; leukocytosis, pneumitis; delirium, convulsion.
Selenium	0.2	0.2	0.2	NA	NA	NA	INH, ING, CON, ABS	Irritant to eye, nose and throat; visual disturbance; headache; chills, fever; dyspnea, bronchitis; metallic taste, garlic breath, gastro-intestinal disturbance; dermatitis; and skin, eye burns.
Vanadium (as Vanadium pentoxide)	0.5	0.05	0.05	0.5 (ceiling value)	1	NA	INH, ING, CON	Irritant to eyes; green tongue, metallic taste, eczema; cough; fine rales, wheezing, bronchitis, dyspnea; irritant to the throat
Zinc	NA	NA	NA	NA	NA	NA	INH	Sweet, metallic taste; dry throat, cough; chills, fever; tight chest, dyspnea, rales, reduced pulmonary function; headache, blurred vision; muscle cramps, low back pain; nausea, vomiting; fatigue, lassitude and malaise
ACGIH-American Conference of Governmental Industrial Hygienists Ca-NIOSH considered carcinogen CFR-Code of Federal Regulations CON-Skin or mucous membrane contact eV-Electron volts IDLH-Immediately dangerous to life or health ING-Ingestion INH-Inhalation IP-Ionization potential				NA-Not applicable or available NE-Not established NIOSH-National Institute of Occupational Safety and Health OSHA-Occupational Safety and Health Administration PEL-Permissible exposure limit REL-Recommended exposure limit STEL-Short term exposure limit TLV-Threshold limit values				

Table 2-2 Ten Essentials for Wilderness Travel		
To Find Your Way	For Your Protection	For Emergencies
Map of the area Compass and/or GPS(with sufficient backup battery) Flashlight or headlamp	Sunglasses Extra food and water Extra clothing	Waterproof matches Candle, fuel tablets, or other long-burning fire starter Pocket knife First aid kit

Low-flow well sampling also presents unique physical hazards. Compressed nitrogen gas is often used to provide air pressure and the large storage cylinders can be difficult to manage. Cylinders are to be stored in a secured upright position at all times, in temperatures not exceeding 52° C (125 ° F), and valves should be closed whenever not in use (even if empty). Cylinders should not be dropped, rolled, or dragged, and should be transported using a suitable hand truck. Additional information can be found in Appendix C in the Nitrogen MSDS.

Portable gasoline powered generators may also be used to power air compressors to provide air pressure during low-flow well sampling. Portable generators should only be used in wide open spaces; carbon monoxide poisoning from the toxic engine exhaust is deadly. Gasoline for the generator must only be stored in flammable liquid safety cabinets and should only be used to refuel the generator after it has been turned off and allowed to cool. Gasoline spilled on hot engine parts could ignite. Additional safety information can be found in Appendix D.

2.4 BIOLOGICAL HAZARDS

Biological hazards that could potentially be encountered at during the RI/FS may include snakes, spiders, ticks, fleas, big game and other wildlife, aggressive livestock, poisonous/irritating plants such as poison oak and poison ivy, and micro-organisms such as the hantavirus.

Field personnel should be aware of their surroundings and avoid contact with snakes and insects. Snakes, spiders, and fleas typically occupy cool, dark, moist areas. The possibility of an encounter most frequently arises when reaching into dark, covered places. Suggestions for controlling the risks associated with snakes and insects include using a long stick to break apart webs or to remove soil cover from sheltered areas. A flashlight should also be used to inspect dark cavities before reaching into them.

Big game animals (deer, elk, and moose) are often seen from vehicles while traveling to and from sites, but are easily scared away and are rarely seen on foot. If big game is encountered while on foot, the National Parks Service (NPS) recommends staying at least 75 ft (25 yds) away. While generally docile, if game feel threatened, they will charge and attack; especially females with young. Other more dangerous wildlife (but notably more uncommon) may include wolves, bear, mountain lions, and coyotes. The NPS recommends staying at least 300 ft (100 yds) away if one of these is encountered.

Aggressive livestock are another (rare but legitimate) biological safety concern. It may be

necessary to enter an active pasture to access a sample location. Livestock are generally very skittish and can easily be frightened, but personnel should still be cautious, maintain a distance of 75ft (25 yds), and avoid turning their back on the animals. A pasture or enclosure with a male cow (bull) should never be entered. Adult males are generally separated from the females and juveniles and are kept by themselves. They are easily distinguished and are very volatile; they should not be approached.

As a matter of courtesy, field personnel should obtain permission from private landowners prior to entering private lands and immediately close any gates opened in order to access sampling stations and when leaving such stations to make sure that livestock do not inadvertently escape.

Poisonous plants such as poison ivy and poison oak grow wild in dark, moist areas, and at the base of or around seedling and adult trees. Some individuals are prone to skin rashes on contact with the oil from certain plants. A visual site inspection and identification of possible poisonous plants should be completed prior to each shift so that assigned personnel are aware of the potential for exposures.

The Center for Disease Control in Atlanta, Georgia has established a hotline for inquiries regarding the hantavirus, at (877)-232-3322. Hantavirus has resulted in several deaths in the western part of the United States. While there may not have been any outbreaks or notices of the virus at a given project site, field personnel should be aware of the exposure route for the hantavirus and potential control methods. The hantavirus is transmitted through atmospheric dispersion of dried rodent excreta. The disease associated with the hantavirus begins with one or more symptoms that may include fever, muscle aches, headache, and cough. The disease progresses rapidly to a severe lung disease that often requires intensive care and treatment.

3.0 ASSIGNMENT OF RESPONSIBILITIES

Implementation of the Health and Safety Plan will be accomplished through an integrated effort of the following personnel:

Table 3-1: Project Health and Safety Program Contact List			
Company or Agency	Contact	Title	Telephone
P4 Production	Barry Koch	Special Project Lead—Mining / Program Manager	208-547-1439 (work)
	Vance Drain	Project Manager	801-617-3250 (work) (b) (6) (cell)
	Cary Foulk	Senior Advisor	970-879-6260 (work) (b) (6) (cell)
	Ray Bradish	MWH EH&S Manager	303-533-1964 (work) (b) (6) (cell)

Figure 3-1 presents the complete program organizational structure including responsibilities under the project health and safety program. The roles of the key individuals from the preceding table are discussed further in the following paragraphs. Individuals involved in the project will follow this plan and will sign the *Personal Acknowledgement Form* in Appendix F.

3.1 VICE PRESIDENT-IN-CHARGE

As the senior management representative for the program, the Vice President-in-Charge is responsible for defining program objectives, allocating resources, establishing the management organization, and evaluating program outcomes. The Vice President-in-Charge, working through the assigned MWH Program Manager, is ultimately responsible for:

- Providing the facilities, equipment, and budget needed to perform work safely;
- Ensuring adequate personnel and schedule for safe operations;
- Ascertaining appropriate review and distribution of health and safety documents;
- Supporting the efforts of program and field personnel; and,
- Applying appropriate disciplinary action for unsafe acts or practices.

3.2 PROJECT MANAGER

The Project Manager has overall responsibility for the safe performance of project activities. If a health and safety issue develops in the course of performing the contract that requires consultation with the client, the Project Manager is responsible for contacting the appropriate client representative and obtaining agreement on necessary actions, and for providing project personnel with suitable guidance.

3.3 PROGRAM SAFETY OFFICER

The PSO shall:

- Work with the OSO to implement the requirements of this Health and Safety Plan.
- Be available for consultation with the Project Manager, FTL, and the OSO during the course of field work covered by this Health and Safety Plan.
- If needed, conduct periodic inspections of field activities to evaluate the effectiveness of the health and safety program and compliance with the Health and Safety Plan.
- Be responsible for the preparation of and any subsequent amendment to the Health and Safety Plan.
- Consult with the Project Manager as necessary prior to approving changes to the Health and Safety Plan.
- Coordinate modifications to the Health and Safety Plan with the OSO.
- Prepare the materials to be used for project-specific health and safety training.

The PSO is also responsible for the following:

- Ensuring that health and safety documentation conforms to applicable federal, state, and local health and safety requirements.
- Ensuring that medical monitoring, incident reporting, and health and safety recordkeeping conform to applicable federal, state, and local requirements.
- Overseeing project-specific employee training and medical surveillance.

3.4 ON-SITE SAFETY OFFICER

The MWH OSO, which will be determined on a project to project basis, has the responsibility and authority to halt or modify any activity or to remove personnel from the site if he or she considers conditions to be unsafe. Additionally, the OSO shall:

- Be responsible for implementing the requirements of this Health and Safety Plan.
- Maintain current certification in cardiopulmonary resuscitation (CPR) and first aid.
- Ensure that field personnel understand and comply with safety requirements, as outlined in this Health and Safety Plan.
- Ensure that a copy of the Health and Safety Plan accompanies each sampling team.

- Coordinate with the PSO, FTL, and Project Manager to address any unanticipated conditions that develop during the course of field activities.
- Coordinate with any subcontractor-designated OSO to resolve unsafe behavior and unsafe conditions posed by subcontractor personnel.
- Be responsible for dismissing subcontractor personnel when resolution of unsafe acts and conditions cannot be reached.
- Obtain approval of amendments to the Health and Safety Plan from the PSO before implementing any deviations from stipulated health and safety procedures.
- Provide the field personnel with the JRA worksheets and review them daily during tailgate safety meetings.
- Conduct and document daily safety debriefing meetings and inform team leader of any accidents or near hit/misses.
- Be responsible for controlling the entries to and exits from sampling locations.
- Monitor on-site hazards and conditions.
- Monitor field personnel for signs of thermal stress and fatigue.
- Enforce the buddy system.
- Enforce procedures for personnel and equipment decontamination, as specified in this Health and Safety Plan.
- Know emergency procedures and evacuation routes, as well as the telephone numbers of the nearest ambulance service, local hospital, poison control center, fire department, and police department.
- Verify the route to emergency medical facilities, and ensure that route information is posted.
- Serve as the primary MWH contact during any on-site emergency.
- Direct responses to emergencies as outlined by emergency response plans (see Appendix E).
- Participate in accident/incident and near miss investigations.
- Ensure that personal protective equipment (PPE) specified for use in this Health and Safety Plan is available and is being used by project personnel.
- Ensure that equipment used for assessing health hazards is calibrated and maintained in good working order.

- Periodically inspect protective clothing, as well as equipment used for assessing health hazards, for defects and signs of wear.
- Inspect and maintain first-aid kits and other emergency supplies.
- Confirm with the PSO or the responsible subcontractor official the ability of each individual assigned to field activities to perform site work, and maintain a file of current training and medical surveillance certificates.
- Enforce written medical restrictions for field personnel, as necessary.

3.5 FIELD TEAM LEADER

The FTL, which will be determined on a project to project basis, is responsible for assembling and managing the field personnel and field equipment during the sampling event. He should thereby assist the OSO in looking out for unsafe equipment and procedures. The FTL is also responsible for managing the sampling schedule and determining what team members sample what location or perform what task. There may be an occasional task or sampling location is more difficult to undertake, or reach, than others. It is therefore be the responsibility of the FTL to delegate tasks responsibly, keeping safety in mind. The FTL is responsible for sending, via email, a daily field report to the P4 Production Program Manager. Thus it is the responsibility of the FTL to discuss with the OSO any incidents so that the FTL can include this in his/her daily report.

3.6 FIELD PERSONNEL

Field personnel are also responsible for understanding and complying with the requirements of this Health and Safety Plan, and are required to sign an acknowledgment to that effect. Field personnel are also responsible for bringing perceived unsafe conditions, accidents, or near hits/misses to the attention of the FTL and OSO during each daily safety debriefing meeting, or sooner if conditions warrant. During the daily tailgate safety meetings, any subcontractor personnel who will be providing services shall inform the rest of the field team of any additional hazards posed by their procedures or the operation of their equipment.

3.7 SITE VISITORS

Visitors, including MWH and subcontractor management or staff, regulatory agency personnel, or client personnel, may be present at the project site during field activities. Visitors can most likely be provided with a general viewing area at a safe location that will not contribute any cross contamination. The OSO can provide a brief overview of the field activities to any site visitors.

If unannounced visitors request access to a project site, the OSO shall inform the appropriate client representative to obtain permission or denial of access.

4.0 PERSONNEL TRAINING

Individuals assigned by MWH to complete field work in the Southeast Idaho Phosphate Resource Area will, as appropriate, be required to meet the general site worker standards of this Plan including the training requirements described below.

4.1 INITIAL SITE-SPECIFIC HEALTH AND SAFETY TRAINING

Site-specific health and safety training will be provided by P4 to MWH employees charged with completing the field assignments as part of this investigation. This site-specific safety training attempts to encompass all hazards that may be encountered at any of the P4 mines. This training also contains a vehicle safety checklist that must be passed before driving on the premises is allowed. This training document is attached herein as Appendix G, *Monsanto Contractor/Guest ES&H Site Guidelines*. P4 also requires contractors to complete a pre-Job Risk Analysis (JRA) worksheet for each individual job the contractor performs. JRAs are meant to bring to light the potential hazards and risks associated with each job. A blank JRA worksheet is attached herein as Appendix H. Furthermore, N.A. Degerstrom Inc., the contracted on-site mining operator, requires that all users of the haul roads at the site be trained in haul road safety. A copy of the Degerstrom training document is attached herein as Appendix I, *Degerstrom Ore Haul Road Travel Requirements*.

P4 Production's three Sites, associated surface water features that drain these Sites, and applicable background locations, form the study area for the project for which this health and safety plan covers. A specific map of the project area will be located in the task-specific Sampling and Analysis Plans (SAPs).

On the basis of available and extensive information, MWH has demonstrated that the work being conducted under this plan does not involve the reasonable possibility for employee exposure to safety or health hazards attributable to hazardous substances. Furthermore, the waste rock, which is the source of contamination of interest, does not meet the four-prong definition of a hazardous substance per 29 CFR 1910.120(a)(3). Therefore, the training requirements of 40 CFR §1910.120 are not applicable to field personnel involved in the 2009 sampling efforts; however, it is recommended that all MWH personnel are HAZWOPER trained.

It is the responsibility of the OSO to review each area subject to sampling, prior to allowing a field team to enter the area, to ensure that none of the proposed sampling areas fall within the above-listed locations or activities. If a proposed sampling location or activity is determined by the OSO (or other informed person) to fall within one of the above-listed locations or activities, the OSO has the authority and responsibility to stop the proposed sampling activity until it is ascertained that the field personnel entering the area meet the requirements of 40 CFR §1910.120, including the appropriate level of HAZWOPER training.

Notwithstanding the above statements, MWH expects that all field personnel are familiar with, understand, and follow the health and safety requirements and guidance provided in this manual. Training will be conducted prior to job start-up, and as needed thereafter. The PSO, OSO, and/or the Program Manager(s) will conduct the initial site-specific training to ensure that field

personnel have a thorough understanding of this Health and Safety Plan, applicable standard operating procedures (SOPs), and the chemical, physical, and biological hazards that may be associated with the investigation. This training will be repeated for new field personnel tasked with field assignments connected with the investigation as well, prior to starting field work.

Topics that will be addressed in the initial site-specific health and safety training will include the following:

- Names of personnel and others responsible for project safety and health.
- Employee rights and responsibilities under OSHA.
- The Health and Safety Plan, including the medical surveillance program.
- The acute and chronic effects of exposure to hazardous substances that may be encountered during field activities; the potential routes of exposure and symptoms of exposure for these substances; the PELs and IDLH concentrations assigned to these substances; and the level of personal exposure that can be anticipated.
- Likely physical hazards such as slipping, tripping, or falling; noise; electrocution; being struck; or being caught in or between moving equipment.
- Site control measures, including procedures for chemical handling, spill containment, decontamination, fire prevention, and any SOPs prepared specifically for the project.
- Hazard communication (per the requirements of 40 CFR § 1910.1200).
- PPE and the action levels for upgrading PPE and for evacuating work sites.
- Engineered controls such as dust suppression techniques adopted for this project.
- Emergency procedures and equipment.
- Any procedures adopted for air monitoring, including the functions, limitations, use, and maintenance of monitoring equipment.
- Proper use of heavy equipment and machinery, as applicable.
- Personal cleanliness and restrictions on eating, drinking, and smoking at the job site.
- Heat and cold stress prevention, monitoring, and treatment.
- Contractor injury and illness prevention programs, if applicable.

Field Personnel will also be instructed in the use of the buddy system. The buddy system will be used whenever field personnel are collecting samples from any location in the project study area. The buddy system is a method of organizing work groups so that an individual is always available to provide his or her partner with assistance in an emergency; to monitor his or her

partner for signs of chemical or physical exposure, to periodically check that his or her partner's PPE is functioning properly, and to notify emergency response personnel if an emergency occurs. The buddy system usually requires that two or more people maintain visual contact while working. However, the buddy system can employ radio or cell phone contact if site conditions are such that a person could otherwise work alone. In order to deviate from the buddy system, the PSO will require an explanation of the specific task to be completed, along with a procedure for assuring that a single person work party is safe.

Note that activities that will be conducted during the investigation WILL require the MSHA 24-hour training specified under 30 CFR 48.21 through 48.30. The OSO will maintain documentation that each site worker has successfully completed the initial site-specific training and any additional safety training furnished by a mine operator at an active mine site.

4.2 TAILGATE SAFETY MEETINGS

Tailgate safety meetings will be conducted by the OSO each day field activities take place. This meeting will review the JRAs for the applicable jobs, cover site activities, changes in site conditions, other activity-specific health and safety issues, and include a review of pertinent topics detailed in the initial site-specific health and safety training. Field personnel will also be informed of the availability of emergency assistance, as well as the most probable route of evacuation from a site, should an evacuation become necessary.

A daily safety debriefing will also be conducted at the conclusion of every work day; at which any unsafe working conditions or equipment and any incidents or near hits/misses must be discussed and documented. The OSO must inform the FTL of any such incidents.

If MWH personnel are working directly with a contractor (i.e. a well driller), the MWH contractor supervisor is to engage in this same tailgate safety meeting process and report to the OSO or PSO any safety concerns and incidents or near hits/misses.

4.3 BLOODBORNE PATHOGENS AND FIRST AID/CPR

Personnel assigned to conduct field work for this project do not conduct first aid or CPR as a primary job function. Rather, selected field personnel (e.g., the OSO) have been trained in first aid and CPR for application in an emergency only. Acting in the capacity of a designated emergency first aid provider is not mandatory, and anyone who is uncomfortable with the possibility of being so designated should notify the OSO.

4.4 DOCUMENTATION OF TRAINING

Written documentation verifying compliance with the training requirements of this section must be submitted to the MWH PSO or OSO prior to the beginning of field work or site access. Documentation of each worker's current training credentials will be kept by the OSO for review by authorized agency personnel.

5.0 MEDICAL SURVEILLANCE

Personnel who will be completing field assignments in support of the investigation on locations or involved in activities in which the requirements of 29 CFR § 1910.120 govern (see discussion in Section 4.1 of this Plan), must be participating in a medical surveillance program consistent with the requirements of that regulation. These requirements mandate that field personnel receive medical examinations prior to participating in hazardous waste site activities; annually; upon termination; following occupational exposure or injury; and additionally as needed, on a case-by-case basis.

The medical surveillance program required of each company that allows personnel to conduct field work at hazardous waste sites must be overseen by a licensed physician who is certified in occupational medicine by the American Board of Preventive Medicine, or, who by training and experience, is Board-eligible. When applicable, the MWH PSO will maintain copies of the physician's written authorization statements that employees conducting hazardous waste site operations are fit for hazardous waste site duty and are able to wear respiratory protection. No one shall be permitted to participate in hazardous waste site operations subject to these requirements until a copy of their medical certification is received by the MWH PSO. Copies of the physician's authorization for field personnel will be available to the field personnel upon request. Medical and exposure records will be retained for the length of the employee's employment, plus 30 years.

Field personnel will receive additional medical monitoring upon notifying the OSO, PSO, Program Manager, or other authorized MWH personnel of symptoms consistent with over-exposure to site contaminants, or if the employee is injured or exposed to contaminants at concentrations in excess of a PEL during emergency response operations. Further medical examinations may be required before an employee returns to work after a serious illness or injury. Such examinations may be necessary to assure the employee's continued ability to carry out assigned duties. The need for these examinations will be determined by the MWH PSO, in cooperation with the occupational health physician representing the company. An injury or illness incurred by one of the field personnel, whether on or off the job, shall be reported to the PSO or OSO immediately. Such injury or illness may also require work restrictions when/after the employee returns to work. If the injury or illness required seeing a physician, either the attending physician or the physician giving the employment physical will be involved in deciding when the employee can return to work, and if any work restrictions will apply.

6.0 PERSONAL PROTECTIVE EQUIPMENT

6.1 PERSONAL PROTECTIVE EQUIPMENT

The Environmental Protection Agency (EPA) designations of Levels D, C, B and A for PPE are used to describe the general PPE ensembles that may be employed during hazardous waste site operations. These ensembles are depicted in Figure 6-1. Based on site contaminant information and established exposure limits, Level D has been selected as the level of protection appropriate for field personnel during this investigation. Field personnel will also adhere to the requirements of individual mine operators when collecting samples at active and inactive mine sites. These requirements may include the use of hardhats, eye protection and steel-toed boots. It is the responsibility of the OSO and the OSO representing any subcontract personnel to ascertain the appropriate/required level of PPE for each mine site, communicate such findings to the field personnel, and to ensure that the field personnel are provided with the PPE in a timely manner.

PPE that will be employed for project field tasks and procedures is identified in the Activity Hazard Analysis in Appendix A. For activities undertaken during this project, personnel will incorporate the following into the standard Level D ensemble:

Coveralls:	Personnel will wear a work uniform that includes long pants and a short-sleeved t-shirt at a minimum.
Gloves:	Nitrile gloves are required when handling samples, reagents, decon solutions, and calibration standards.
Hardhat:	Personnel will wear a hardhat when entering active and inactive mine pits to protect against rock falls, when they are visible from the haul road, and when supervising well installations.
Safety Glasses:	Personnel will wear safety glasses when entering active and inactive mine pits and when visible from the haul road. They will also be worn during sample collection, equipment decontamination, and when supervising well installations.
Ear Plugs:	Personnel will use ear plugs or ear muffs with sufficient muffling abilities while drill rigs are in operation.

Once on site, the OSO and the OSO representing any subcontractor personnel will evaluate work conditions and adjust the level of PPE as necessary to properly protect field personnel and meet the local mine requirements. When specifying a PPE ensemble, the following will be evaluated:

- The local mine requirements;
- The anticipated site hazards that were used to select the initial PPE ensemble;
- The limitations of each piece of PPE;
- Work duration;
- The effect of temperature extremes on the PPE ensemble;

- PPE maintenance, storage, decontamination, and disposal requirements;
- Inspections of PPE completed prior to, during, and after use;
- Personnel training in PPE use and the need for fit-testing;
- Procedures for donning and doffing; and
- Evaluation of the effectiveness of the current PPE program.

Adjustments to the PPE ensemble will be communicated to field personnel via amendment of this Health and Safety Plan or during the tailgate safety meeting.

6.2 LEVEL D PERSONAL PROTECTIVE EQUIPMENT

Level D protection may be used when the following conditions are met:

- Substances that pose inhalation hazards are not present above individual or combined PELs.
- Oxygen is present at a minimum concentration of 19.5 percent.
- Toxic organic compounds are not present in the air space at concentrations that exceed normal background concentrations or specified action levels requiring use of respiratory protection.
- Work functions preclude splashes, immersion in, unexpected inhalation of, or direct contact with hazardous concentrations of harmful chemicals.

Level D protective equipment shall consist, at minimum, of the following:

- Dedicated work uniforms with long pants and short-sleeve shirt.
- Steel-toed and shank leather, PVC, or rubber safety shoes or boots meeting the specifications of American National Standards Institute (ANSI) Z41.
- Safety glasses, goggles, face shield, or other approved eye protection.
- Hardhat, unless specifically stated otherwise.

The dedicated work uniforms may include chemical-resistant coveralls or standard Tyvek coveralls, or standard cotton or cotton blend work uniforms. Approved eye protection must meet the specifications of ANSI Z87.1. The use of contact lenses is discouraged, but not prohibited, during Level D operations. However, safety glasses or goggles that fit over prescription lenses or prescription safety glasses or goggles are recommended. Approved hardhats must meet the specifications of ANSI Z89.1.



Level A Protection
Totally encapsulating vapor-tight suit with full-facepiece SCBA or supplied-air respirator.



Level B Protection
Totally encapsulating suit does not have to be vapor tight. Same level of respiratory protection.



Level C Protection
Full-face canister air purifying respirator. Chemical protective suit with full body coverage.



Level D Protection
Basic work uniform, i.e. long-sleeve coveralls, gloves, hardhat, boot, faceshield or goggles.

**SAMPLE PROTECTIVE
EQUIPMENT ENSEMBLES**
FIGURE 6-1

6.3 PPE STORAGE

PPE must be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Potentially contaminated PPE should be stored separately from new PPE and street clothing. Field personnel should always review the manufacturer's instructions for care and maintenance of PPE. PPE storage will be provided in the field by the OSO. However, each individual is responsible for ensuring that his or her issued PPE is protected from extremes of temperature, and is stored in a manner that prevents the PPE from becoming damaged or disfigured.

7.0 HAZARD ASSESSMENT

Because of the relatively low exposures that are expected during the investigation, no vapor or dust monitoring will be undertaken. However, personnel monitoring for heat and cold stress will be performed. Heat and cold stress will be monitored qualitatively, as described in the following paragraphs.

7.1 HEAT STRESS

The stress of working in a hot environment can cause a variety of illnesses, including heat exhaustion or heat stroke; the latter can be fatal. The use of PPE can increase heat stress significantly, although heat stress can overcome people wearing regular, permeable work clothing, as well. To reduce or prevent heat stress, frequent rest periods and the intake of salts and liquids to conserve and replace body fluids may be necessary.

Personnel should recognize the symptoms of heat stress, and take appropriate action on recognition. Some of the symptoms that indicate heat exhaustion are:

- Clammy skin
- Lightheadedness
- Slurred speech
- Rapid pulse
- Weakness, fatigue
- Confusion
- Fainting
- Nausea (vomiting)

If these symptoms are noted, the following steps should be taken:

- Remove the victim to a cool and uncontaminated area;
- Remove protective clothing; and
- Give water to drink, if conscious.

Symptoms that indicate heat stroke include:

- Staggering gait
- Hot skin, temperature rise (yet may feel chilled)
- Incoherent, delirious
- Mental confusion
- Convulsions
- Unconsciousness

If these symptoms are noted, the following steps should be taken:

- Remove victim to a cool, uncontaminated area;
- Cool the victim, whole body, with water, compresses and/or rapid fanning;
- Give water to drink, if conscious; and
- Transport the victim to the designated medical facility for further cooling and monitoring of body functions.

HEAT STROKE IS A MEDICAL EMERGENCY!

7.2 COLD STRESS

On days of low temperature, high wind, and humidity, anyone can suffer from the cold. Severe exposure to cold can be life threatening. Several factors increase the harmful effects of cold: being very young or very old, wearing wet clothing, having wounds or fractures, smoking, drinking alcoholic beverages, fatigue, emotional stress, and certain diseases and medications.

Cold weather injuries may be local or systemic. Local cold weather injuries include chilblains (chronic injury of the skin and peripheral capillary circulation) and frostbite. Frostbite occurs in three progressive stages: frostnip, superficial frostbite, and deep frostbite. Systemic cold injuries associated with hypothermia affect the entire body system. Hypothermia is caused by exposure to cold and is aggravated by moisture, cold winds, fatigue, hunger, and inadequate clothing or shelter.

Precautionary measures that will be taken to prevent or mitigate cold stress will include:

- Providing field shelters or wind screens.
- Monitoring temperature and wind speed to determine appropriate safety measures.
- Adjusting work schedule based on weather conditions and temperature.
- Providing insulated clothing for field workers.
- Adhering strictly to the buddy system so that workers can monitor for symptoms of cold stress in their co-workers.

7.2.1 Frostbite Monitoring

Frostbite is a potentially crippling condition that can occur when inadequately protected skin or body parts are exposed to freezing weather. Team members should continually be alert for signs of frostbite in co-workers, and bring any occurrences to the attention of the OSO. A cold feeling, pain, and numbness precede the onset of frostbite. Frostbite usually appears as gray or white waxy spots on skin. Areas most susceptible to frostbite are the nose, ears, and cheeks.

The following steps should be taken to avoid frostbite:

- Dress warmly;
- Wear layers of clothes;
- Keep boots and gloves loose-fitting;
- Stay dry;
- Carry extra clothing;
- Avoid touching cold metal with bare hands; and
- Avoid spilling cold fuel, alcohol, or other liquids that freeze below 32°F on your body or clothing.

If a person is frostbitten, get them to a hospital as soon as possible. If transport to a hospital is not immediately available, get the person to a warm shelter and immediately perform the following:

- Cover exposed areas with additional clothing;
- Wrap the person in blankets or a sleeping bag;
- Give the person warm, non-alcoholic drinks;
- Undress the frozen part and submerge the frozen part in a tub of warm water (102° F to 105°F), or put the frostbitten person in a large tub of warm water, if available, and stir the water;
- Warm with skin to skin contact, such as placing warm hands on frozen nose or ears, (but do not rub); and
- Get the person to a hospital as soon as possible.

Do not rub the frozen part; do not give the person liquor; do not allow the person to walk on thawed feet; do not let the person smoke; do not break any blisters that may form; do not let the thawed part freeze again; and do not warm the frozen part in front of a source of dry heat, such as an open fire or oven.

7.2.2 Hypothermia Monitoring

Hypothermia is a lowering of the body's temperature due to exposure to cool or cold temperatures. Field personnel should be continually alert for signs of hypothermia in co-workers, and bring any signs of hypothermia to the attention of the OSO. Most cases of hypothermia occur at temperatures between 30°F and 50°F. Hypothermia is a medical emergency: if not properly treated, hypothermia can cause death. Safety equipment for hypothermia should include a synthetic sleeping bag and a hypothermia thermometer. Personnel suffering from hypothermia should be transported to a hospital as soon as possible, even if they appear to be recovering.

To prevent hypothermia:

- Eat well prior to exposure;
- Dress warmly; and
- Avoid becoming wet through sweating, rain or snow, or falling in water.

Early signs of hypothermia may include violent shivering, slurred speech, a loss of coordination, confusion and an inability to answer simple questions, unusually irritable or strange behavior, or a tendency to drop or lose clothing or equipment. As hypothermia progresses into more serious stages, the victim typically develops trouble seeing clearly, becomes sleepy and numb, and begins to move with difficulty. Eventually, the victim will lapse into unconsciousness if not properly cared for.

The following actions should be taken to treat a hypothermia victim:

- Get the victim to a warm, dry shelter as soon as possible;
- Remove any wet or cold garments and dry the person thoroughly; and

- Wrap the victim in blankets, sleeping bags, or dry clothing to prevent more heat loss.

If a warm area is not available, build a shelter and put the victim in the warmest, driest area available. Remove any wet or cold garments, and have one or more persons remove their clothing and lay next to the victim, providing skin to skin contact. Then, wrap the victim and rescuers in dry, warm blankets, sleeping bags, or clothing. When the victim becomes conscious, place warm objects along the victim's sides to warm vital areas. When the victim is able to swallow easily, provide warm, sweetened drinks and food, preferably candy or sweets. Do not give the victim alcohol or allow the victim to smoke, do not rub the victim's skin, and keep checking the victim and providing additional assistance as needed.

8.0 SITE CONTROL

Site control is an important part of a field health and safety program. The purposes of site control are to minimize potential worker exposures, protect the public from site hazards, and prevent vandalism of site facilities. Site control procedures that will be implemented during the RI/FS, which are discussed in this section, consist of site security controls and communication systems.

Under no conditions are deviations from safe work practices to be tolerated by anyone on site. If any deviation continues after a reminder of proper procedures or a reasonable warning, the MWH OSO will be informed of the circumstances. The MWH OSO will attempt to correct the unsafe behavior or unsafe condition. Should this attempt fail, the MWH OSO shall halt site activities and dismiss the non-cooperative personnel.

8.1 MULTIPLE-EMPLOYER JOB SETTING

Enforcing safe work practices at a multiple-employer job site presents many challenges. Under OSHA, each employer is required to provide a safe and healthful working environment for its employees (see OSHA poster in Appendix J). Most hazardous waste sites require several contractors to work simultaneously on different project tasks. In this situation, the activities of one company could create hazards for the employees of another company. It is not possible to anticipate every hazard associated with activities at a multiple-employer job site in a Health and Safety Plan. The OSO must discuss particular safety and health issues that may be associated with each day's activities at the daily tailgate safety meeting.

8.2 SITE SECURITY

Existing site controls that are likely to be encountered during the course of the investigation will vary from no controls to strict property perimeter controls. When possible, client personnel will be requested to investigate any suspicious activities at the field sites. In some cases, an independent security watch may be needed. Security at the sites will be the responsibility of the client during periods of inactivity, including weekends. To maintain security at the sites during working hours, the OSO will:

- Control site entrances and exits as necessary through the installation of appropriate safety barricades, signs, and/or signal lights.
- Establish a personnel identification system.
- Be responsible for enforcing entry and exit requirements.
- Utilize temporary fencing to control site access, where feasible.
- Post warning signs around the perimeter of the work area, should the use of temporary fencing not be feasible.

To maintain security during nonworking hours, the OSO will secure the site prior to leaving at the end of a working day and equipment and supplies will be secured or stored in locked facilities.

8.3 COMMUNICATION SYSTEMS

Two general types of communication systems should be available for workers assigned to field projects. One system will ensure adequate communication between field personnel, and the other will ensure the ability to contact personnel and emergency assistance off site. Internal communication will be used to:

- Alert team members to emergencies.
- Pass along safety information, such as weather conditions that could affect heat stress, cold stress or general safety.
- Maintain site control.
- Facilitate site work by being able to call the appropriate party for information without having to decontaminate the work party and equipment and secure the site.

Verbal communication can be impeded by background noise and limitations imposed by PPE. It is therefore vital that pre-arranged signals of communication be arranged prior to the initiation of site activities, particularly when heavy equipment may be operating in the vicinity. Common types of internal communication devices include:

- Radios;
- Noisemakers such as compressed air horns, megaphones, sirens, and whistles; or,
- Hand and arm signals.

External communication systems between on-site and off-field personnel are necessary to:

- Coordinate emergency response efforts,
- Report to upper management about site activities, and
- Maintain contact with essential off-field personnel.

The primary means of external communication are telephones, radios, facsimile machines, and computer networks.

9.0 DECONTAMINATION PROCEDURES

Decontamination procedures are implemented to prevent cross-contamination of samples, to control possible migration of site contaminants to clean areas, and to prevent personnel exposure to chemicals or pathogens that may contaminate clothing or protective gear. Personnel conducting field activities must decontaminate upon the completion of these activities. Equipment must also be decontaminated before it is moved. Any material that is generated by decontamination procedures will be labeled and stored until final disposal arrangements are made.

9.1 GENERAL DECONTAMINATION PROCEDURES

Decontamination procedures shall be supervised by the OSO. The type of solution to be used for equipment decontamination is specified in the task-specific SAP and Field Sampling Plan (FSP). Personnel decontamination will be accomplished using ordinary soap and water or an alcohol based hand sanitizer. Personnel will be required to wash or sanitize their hands, and optionally their faces, before eating or drinking, unless specific procedures are in place to ensure that a drink can be taken without the possibility of contamination. Personnel may also be required to wash or sanitize their hands, and optionally their faces, before leaving the work site. Decontamination solutions will be changed daily at a minimum.

The following decontamination procedures and guidelines shall be implemented:

- Disposable protective clothing will be used when possible to eliminate the need for decontaminating clothing.
- Decontamination procedures will be designed to prevent or minimize direct contact with waste materials.
- Disposable protective clothing and contaminated material will be collected in plastic sacks and disposed of appropriately.

9.2 DECONTAMINATION WASTE HANDLING AND DISPOSAL

Wastes generated as a result of site activities will be handled in accordance with applicable environmental regulations. Investigation-derived wastes and contaminated site materials will be handled and disposed of in accordance with the provisions of the FSP or client specifications. Unless specifically stated, personnel are to treat decontamination wastes as part of the investigation derived wastes.

10.0 EMERGENCY RESPONSE PLANNING

The objective of this Health and Safety Plan is to minimize exposure to chemical, biological, and physical hazards, and to prevent work-related illnesses and injuries. Emergency response planning is included as part of this plan to provide procedures for responding to emergencies that may occur. This section contains information on how to deal with emergencies. It is not the purpose of this Health and Safety Plan, however, to provide guidance for emergency response as part of field operations. Field personnel are instructed to assess emergencies and make the appropriate notification to emergency responders. **Under no circumstances are field personnel to take emergency response actions for which they are not properly trained.**

The MWH OSO will serve as the primary MWH contact during any on-site emergency. The OSO will be responsible for making the appropriate notifications, directing responses to emergencies until relieved by a qualified Emergency Medical Technician (EMT) or equivalently trained professional. As part of his or her duties, the OSO will be required to know basic first aid emergency procedures and evacuation routes, as well as the telephone numbers of the nearest ambulance service, local hospital, poison control center, fire department, and police department. The OSO will also be responsible for verifying the route to emergency medical facilities, and ensuring that route information is posted and available to field personnel. Emergency telephone numbers and maps showing the locations of the hospitals and emergency clinics capable of providing emergency service for field personnel are provided in Appendix E. Telephone numbers for the Poison Control Center, local Police and Sheriff's Departments, local Fire Departments, including the emergency rescue squad, the Office of Emergency Services, MWH management, and client contacts also are included. Copies of the hospital route maps provided in Appendix E will be kept in site support vehicles and field personnel will become familiar with the routes and the travel times involved.

The OSO shall immediately notify the Program Manager of the following:

- Any required site evacuation;
- Any fatality or injury to one or more field personnel that requires medical attention; and
- Any physical hazard creating the potential for death or permanent injury.

Vehicles that can be used to transport injured personnel from work sites will be available during working hours. A system will also be available on site for communicating with off-site personnel. On-site communication systems may include cell phones, two-way radios, or other suitable devices. Additionally, first aid supplies and potable water will be available at every site for emergency use.

Cell phones may not always be operable in remote areas. Thus, when entering remote areas field personnel will file their anticipated itinerary with the FTL. The itinerary will include where the field team expects to be, the travel route, and the expected time of return. The field team will notify the FTL upon their return. If the sampling team leaders do not hear from a field team by an agreed-upon time, the FTL will initiate search and rescue operations. In addition, the FTL

will attempt to call the P4 Program Manager daily to report on the daily activities, any health and safety issues encountered, and the expected itinerary for the next day.

Prior to the start of work, project personnel will be acquainted with established emergency response procedures and equipment. Furthermore the OSO will be certified to render first aid and CPR prior to commencement of field activities. The buddy system will be used when working in remote areas, near significant waterways, or in active or inactive mine pits. The buddy system will not be required while collecting samples in agricultural areas when cell phone contact is available.

Accidents, safety-related incidents, and safety-related near misses will be documented and reported to the MWH EH&S Department, PSO, OSO and P4 and MWH Program Managers on a daily basis at a minimum.

See Appendix K for incident reporting forms and procedures.

11.0 HEALTH AND SAFETY DOCUMENTATION

Examples of some of the forms that may be employed for documenting compliance with the MWH health and safety program and this Health and Safety Plan are presented in the appendices. The MWH PSO or designated OSO will maintain and update these documents. Appropriate regulatory agency personnel shall be granted access to these records if requested.

Unanticipated field conditions may occasionally require temporary modification of this Health and Safety Plan. Client notification and approval procedures will depend on field conditions and nature of the modification. Any upgrade to PPE will be reported in an updated JRA worksheet. Minor changes to the Health and Safety Plan to accommodate on-site conditions can be implemented by the OSO upon review and approval of the PSO; such changes might include minor revisions to decontamination or site control procedures. Permanent changes to this HASP must be approved by the MWH Project Manager Project Manager as listed in Table 3-1.

12.0 GENERAL SITE SAFETY

The health and safety program contained in this portion of each MWH Health and Safety Plan has been developed in accordance with relevant occupational safety and health regulations and requirements, and applies to field sites and workplaces. Because this section is intended to be applicable to a wide range of sites and conditions, there may be information in this section that applies to certain areas of the country only.

The following practices are expressly forbidden during site work:

- Smoking, eating, drinking, chewing tobacco, or applying cosmetics while taking samples or while near exposed samples.
- Contact with potentially contaminated substances; walking through puddles or pools of liquid; kneeling on the ground; or leaning, sitting, or placing equipment on contaminated soil.
- Performance of tasks without a buddy; personnel will be required to use the buddy system unless specifically exempted elsewhere in the Health and Safety Plan.

Personnel must keep the following guidelines in mind when performing field activities:

- Hazard assessment is a continuous process. Personnel must be aware of their surroundings and the chemical and physical hazards that are present.
- Field personnel will be aware of the physical characteristics of each site, including site access, the location of overhead power lines and underground utilities, wind direction, and the location of communication devices and safety equipment.

12.1 GENERAL HEALTH AND SAFETY PROGRAM ELEMENTS

12.1.1 Hazard Communication Program

MWH has a written Hazard Communication Program. This program appears as MWH H & S Policies Procedure No. 1000. A copy of this will be available to field personnel. As necessary, the hazard communication program of subcontractors also will be solicited for use as a project reference. MWH and subcontractor field personnel will be made aware of the MWH Hazard Communication Program and have access to MSDSs for any chemicals brought to field sites. MWH will be responsible for supplying MSDSs and each field team will have them in their possession when in the field.

12.1.2 Sanitation

Work breaks, eating, drinking, and paperwork tasks will be performed in the field vehicle or other suitable location away from sampling location. Field personnel will wash or otherwise sanitize their hands prior to eating or drinking.

The OSO is responsible for ensuring that an adequate supply of water is available at the site. During times of heavy labor and hot temperatures, it is recommended that approximately one liter of water per hour be ingested. Sport-type beverages also may be provided for field personnel. It is to be assumed that there is no potable water in the field. When decontamination procedures interfere with the ability of field personnel to obtain sufficient drinking water, personnel may drink water without prior personnel decontamination under the following stipulations:

- Water is dispensed from a cooler with a pull-lever pouring spout. Push-button pouring spouts are unacceptable, as dirty fingers can easily contaminate the pouring spout.
- Minimum three-inch tall disposable drinking cups must be used and discarded after each use.
- Drinking cups must be dispensed out of a plastic or metal dispenser attached to the cooler, allowing the bottom of the cup to be grabbed without touching the top rim.
- Bottled water or sports drinks with removable caps, taking care not to touch the drinking surface with potentially contaminated hands.

12.1.3 Illumination

All site work will be done during daylight hours, with the exception of driving to and from the work site.

12.1.4 Standard Emergency Hand Signals

Team members should be familiar with the following emergency hand signals:

- Hand gripping throat: “Respirator problems, can’t breathe.”
- Grip team member’s wrist or place both hands around waist: “Leave site immediately; no debate!”
- Thumbs up: “OK, I’m all right; I understand.”
- Thumbs down: “No, negative.”
- Hands on face: “Put on respirator.”

12.1.5 Fire Protection

Field activities performed during the summer at this location could potentially result in a fire at the site. Cigarette smoking is forbidden at any sampling locations and should be done with care otherwise (extinguished and disposed of properly). Driving off road should be avoided if possible, as vehicles driving over tall stands of brush and grasses can easily spark a fire.

Electrical wiring will be free from frayed ends and sections, and hook-ups will be checked for loose fittings. Portable power tools will be connected to a ground fault circuit interrupter, and care will be taken to ensure that electrical connections do not exceed the maximum load capacity for any one circuit.

12.1.5.1 Wildfires

Wide open areas of natural brush present the danger of wildfires. Many project sites have structures that can provide enough of a fire break to prevent a wildfire from endangering field personnel, but such a structure does not provide absolute protection. The MWH OSO will therefore check regularly with the local fire department during the most common wildfire months of July through November. Should a wildfire threaten a work site, the MWH OSO will watch for changing conditions and evacuate and secure each active site, in accordance with local fire department instructions.

12.1.5.2 Fire or Explosion Response Action

The actions listed below are in a general chronological sequence. Conditions and common sense may dictate changes in the sequence of actions and the addition, elimination, or modification of specific steps.

Immediate Action. Upon detecting a fire/explosion, employees will notify the fire department and determine whether or not the fire is small enough to extinguish readily with immediately available portable extinguishers or water, or if other fire-fighting methods are necessary. Non-essential personnel will be directed away from the area of the fire. If it is judged that a fire is small enough to fight with available extinguishing media, employees will attempt to extinguish the fire provided that:

- They have been properly trained on the use of the specific fire extinguisher to be used.
- They are able to approach the fire from the upwind side, or opposite to the direction of the fire's progress.
- The correct extinguisher is readily available.
- No known complicating factors are present, such as likelihood of rapid spread, imminent risk of explosion, or gross contamination.

Personnel leaving a fire/explosion area will notify the fire department and will account for employees in that area as soon as possible. The OSO or designee will perform a head count of sampling team members.

Notification. The MWH OSO will be notified as soon as possible of the location, size, and nature of the fire/explosion. A member of the MWH management team will notify appropriate agency personnel in the event of a fire or explosion resulting in a release of a hazardous material to the environment. As conditions dictate, the OSO will declare an emergency, initiate the remedial procedures, request assistance from the fire department, and make the necessary on-site and off-site notifications. If assistance from the fire department is required, an escort appointed by the OSO will direct responders' vehicles over clean roads to the extent possible to limit contamination. Note: National Fire Protection Association (NFPA) guidelines call for notifying the fire department, even for small fires, to ensure proper handling.

Rescue. If personnel are unable to evacuate themselves from a fire/explosion area for any reason, their rescue will be the first priority of responders. The FTL and/or OSO will determine whether on-site resources are sufficient to proceed, or if rescue must be delayed until outside responders arrive. **Field personnel are not to take any actions which place themselves or other in danger and/or for which they have not been properly trained.**

Fire-Fighting Procedures. Planned fire-fighting procedures are described below. These apply to small fires that the project personnel are able to control.

Fire During Working Hours: In the event that a fire occurs during working hours, the following measures will be taken to put out the fire provided that the person is properly trained to do so. These measures are sequential, that is, if the first measure does not succeed in containing the fire, the next measure will be initiated.

- Use fire extinguishers.
- Confirm that request for assistance from the fire department has been made.
- Utilize earth moving equipment, foam unit, and water truck, as appropriate. Brush fires will be extinguished with water.

Fire During Non-Working Hours: In the event of a fire during non-working hours, existing alarms, site security (if applicable), or whomever from the project team is notified, will notify the MWH OSO or PSO. Additional actions will be consistent with procedures established for a fire during working hours.

Response Coordination. Upon arrival of outside responders from the fire department, the OSO will coordinate with the leader of the outside responders to direct fire-fighting activities; however, the control of the scene is now the responsibility of the leader of the outside responders.

Protection of Personnel. The primary methods of protecting personnel from fire conditions will be by distance and remaining upwind. Based on the conditions, the OSO will determine appropriate distances and the selection of personal protective equipment for field personnel.

Decontamination. At the conclusion of fire fighting activities, the OSO will:

- Determine to the extent practicable the nature of the contaminants encountered during the incident.
- Arrange for outside responders' fire response equipment, and on-site equipment as necessary, to be processed through decontamination, using methods appropriate for the contaminants involved.
- Equipment not easily decontaminated shall be labeled and isolated for further action, such as determining specific contaminants by wipe sampling or awaiting the delivery of specific decontamination media and supplies.

Fire Extinguisher Information. The four classes of fire, along with their constituents, are as follows:

Class A - Wood, cloth, paper, rubber, many plastics, ordinary combustible materials.

Class B - Flammable liquids, gases, and greases.

Class C - Energized electrical equipment.

Class D - Combustible metals such as magnesium, titanium, sodium, and potassium.

Examples of proper extinguishing agents are as follows:

Class A - Water
Water with one percent AFFF Foam (wet water)
Water with five percent AFFF or Fluoroprotein Foam
ABC Dry Chemical
Halon 1211

Class B - ABC Dry Chemical
Purple K
Halon 1211
Carbon Dioxide
Water with six percent AFFF Foam

Class C - ABC Dry Chemical
Halon 1211
Carbon Dioxide

Class D - Metal-X Dry Chemical

No attempt should be made to extinguish a large fire. Large fires should be handled by the fire department. The complete area of the fire should be determined. If human life appears to be in danger, or the spread of the fire appears to be rapidly progressing, move personnel further upwind and away from the fire. Do not attempt to extinguish even a small fire if you have not been properly trained to do so.

Use of Fire Extinguishers. Inspect the fire extinguisher on a monthly basis to ensure that the unit is adequately charged with extinguishing media. Do not store a fire extinguisher on its side. To use the extinguisher, follow the acronym PASS for instructions listed below:

1. **P**ull the pin on the top of the unit.
2. **A**im at the base of the fire.
3. **S**queeze the handle on the top of the unit.
4. **S**weep the extinguishing media along the base of the fire until the fire is out.
Ensure that the fire is fully cooled before assuming it is completely extinguished.

12.1.6 Earthquake and Disaster Preparedness

If an earthquake or natural disaster occurs during working hours and the magnitude is such that field personnel may be in danger, the MWH OSO will initiate the site evacuation procedure. This action is to be taken only if in the judgment of project personnel and/or OSO the earthquake is large enough to have potentially caused damage to any of the structures or equipment being used on the site. If the earthquake or disaster occurs during non-working hours, the OSO will determine whether safe entry onto sampling locations can be made, or if an inspection is needed first. If at any time the inspection team feels that they need the assistance of the fire department, the inspection shall cease until the fire department is able to assist. The inspection will be conducted using the buddy system. The team will look at structures, equipment, and any chemical storage areas for signs of cracks or deterioration. When assessing areas known to contain chemicals, appropriate air monitoring equipment will be used to ensure that leaks are detected quickly and without injury to the inspection team. When inspecting areas where chemical releases could have occurred as a result of a breach of containment, Level B PPE is recommended.

12.2 COMMON PHYSICAL HAZARDS AND CONTROLS

This section provides information concerning the common physical hazards associated with site investigations and recommended controls to minimize risk to field personnel. Section 2.0 and Appendix A list the physical hazards specific to this project.

12.2.1 Slip/Trip/Fall

Field personnel are to be vigilant in providing clear footing, clearly identifying obstructions, holes, or other tripping hazards and maintaining an awareness of uneven terrain and slippery

surfaces. It is necessary that shoes providing more elaborate tread be worn to minimize slip, trip and fall hazards.

12.2.2 Heavy Lifting

During manual lifting tasks, personnel will remember to lift with the force of the load suspended on their legs and not their backs. They are to maintain a straight back and hold the object close to the body. Mechanical lifting devices or the help of a fellow field team member should be sought when the object is too heavy for one person to lift.

12.2.3 Motor Vehicle Hazards

Motor vehicle accidents can occur any time people drive. Field personnel are required to employ defensive driving techniques, and obey site speed limits and vehicle safety requirements. Accidents are to be reported to the MWH OSO. Working in an active mine area poses unique hazards to personnel whether in a vehicle or as a pedestrian. Mine equipment, especially haul trucks, are often large, may operate at relatively high rates of speed, often have limited visibility, and cannot stop or maneuver like over-the-road vehicles. Unique mine driving rules often apply within a local mine that are different from public road rules. Haul trucks within a mine area often have the right-of-way in every instance. Therefore, it is extremely important that while walking or driving within an active mine area, to be exceptionally alert to all traffic around you. When in doubt, yield the right-of-way. **Field personnel are required to wear seatbelts at all times when in a moving vehicle and the driver must refrain from using his/her cell phone.**

12.2.4 Sharp Edges and Pinch Points

During the course of this site investigation, it is feasible that personnel will encounter sharp edges and pinch points. Sharp objects may include site debris, field tools, equipment, or other objects. Pinch points are places where the hands may be caught between objects or moving parts. When danger of cuts to the hands or other body parts is probable, employees will either arrange paths where personnel may walk without encountering sharp edges, or will ensure during the tailgate safety meeting that areas with known sharp edges are brought to the attention of field personnel. Heavy work gloves shall be used in conjunction with any chemical resistant gloves in circumstances where handling sharp objects are required.

12.3 SEVERE WEATHER

While each project site will be subject to varying types of weather conditions, this section provides general information and controls on several types of severe weather.

12.3.1 Lightning

If a lightning storm is suspected or observed, site activities must be stopped, and site equipment must be evaluated for its potential for acting as a lightning rod. Personnel should wait indoors for the storm or lightning event to end. If the strike of lightning occurs and personnel are out in the field, the response should be to disband from one another and lay low to the ground by

dropping to your knees and bending forward with your hands wrapped around your knees, away from any poles or trees.

Persons struck by lightning will receive a severe electrical shock and may be burned, but they carry no electrical charge and can be handled safely. Someone who appears to have been killed by lightning often can be revived by prompt action. Those unconscious but breathing probably will recover spontaneously. First aid and CPR should be administered as appropriate until medical assistance arrives. Realize that victims who appear to be only stunned or otherwise unhurt also need attention. Check for burns, especially at fingers and toes and next to metal buckles, jewelry, or personal items that the victim is wearing. Remember to treat for shock.

12.3.2 Tornadoes

Tornadoes usually develop from thunderstorms and normally occur at the trailing edge of the storm. Most tornadoes occur in the months of April, May, June, and July in the late afternoon and early evening hours.

When storms are predicted for the project areas it is necessary to monitor weather conditions on a radio. A tornado watch is issued when favorable conditions exist for the development of a tornado. A tornado warning is issued by the local weather service office whenever a tornado has actually been sighted or is strongly indicated by radar.

If a tornado warning is issued, seek shelter immediately. If there are permanent buildings located on site, enter one immediately and move toward interior hallways or small rooms on the lowest floor.

If a tornado warning is issued and you are in a vehicle or a site trailer, leave and go to the nearest building. If there are no buildings nearby, go in the nearest ditch, ravine, or culvert, with your hands shielding your head.

If a tornado is sighted or a warning issued while you are in open country, lie flat in a ditch or depression. Hold onto objects secured to the ground, such as a bush or fence post, if possible.

Once a tornado has passed the site, field personnel are to assemble at the designated assembly area to determine if anyone is missing or injured. Administer first aid and seek medical attention as needed.

12.3.3 Winter Storms

When snow or ice storms are predicted for the project area, field personnel should monitor radio reported weather conditions. A winter storm watch is issued when a storm has formed and is approaching the area. A winter storm warning is issued when a storm is imminent and immediate action is to be taken.

When a storm watch is issued, monitor weather conditions and prepare to halt site activities. Notify the Project Manager or FTL of the situation. Seek shelter at site buildings or leave the site and seek warm shelter.

If you are caught in a severe winter storm while traveling, seek warm shelter if road conditions prevent safe travel. If you are stranded in a vehicle during a winter storm:

- Stay in the vehicle. Disorientation comes quickly in blowing and drifting snow.
- Wait for help.
- Keep a window open an inch or so to avoid carbon monoxide poisoning.
- Run the engine and heater sparingly.
- Keep watch—don't let everyone sleep at the same time.
- Exercise occasionally.

12.4 ENGINEERED CONTROLS

Where economically and practically feasible, engineered controls may be selected to reduce exposure of field personnel to health or safety hazards. The OSO and FTL should always be on the lookout for potential engineered controls that may be implemented.

12.5 ADMINISTRATIVE CONTROLS

When engineered controls are not feasible, administrative controls in the form of work practices will be implemented to minimize risk to personnel from site hazards. Work practices that may be instituted include removing non-essential personnel from sampling areas and work rotation to control exposures to extreme thermal stress.

APPENDIX A
ACTIVITY HAZARD ANALYSIS

Tasks	Hazards	Controls	PPE Required
Sampling at Operating Mine Sites (including sites undergoing reclamation)	<ul style="list-style-type: none"> Cuts and scrapes 	<ul style="list-style-type: none"> Follow procedures of mine operator. Report injuries to buddy or to person designated by mine operator for first aid if necessary. Come to work alert and ready—make sure that general awareness of surroundings is part of job planning and execution. Wear heavy work gloves when handling sharp objects, and point sharp objects toward the ground. 	<p>Minimum: hard-hat, safety glasses, boots, long pants, and cotton shirt; heavy work gloves for handling sharp objects.</p> <p>Additional PPE as specified by the mine operator.</p>
	<ul style="list-style-type: none"> Heat or cold stress 	<ul style="list-style-type: none"> Monitor for heat and cold stress as outlined in the Health and Safety Plan (see Section 7.0). 	
	<ul style="list-style-type: none"> Slips/trips/falls 	<ul style="list-style-type: none"> Maintain general awareness of surroundings. 	
	<ul style="list-style-type: none"> Being struck by heavy equipment or caught between equipment and a stationary object 	<ul style="list-style-type: none"> Receive site-specific hazard training. Be alert to the direction of traffic flow. Maintain eye contact with heavy equipment operators and give them the right-of-way. Never stand between operating vehicles and nearby stationary objects. Ask the mine operator where the blind spots for each piece of equipment are located—DO NOT STAND IN BLIND SPOTS. 	

Tasks	Hazards	Controls	PPE Required
Sampling at Operating Mine Sites (continued)	<ul style="list-style-type: none"> High wall collapse 	<ul style="list-style-type: none"> Receive site-specific hazard training. Perform work under escort of mine employee. Do not stand between high wall and heavy equipment—make sure you have an escape route. Know the mine emergency signals and evacuation procedures. 	
Sampling at Inactive Mine Sites	<ul style="list-style-type: none"> Cuts and scrapes Slips/trips/falls Dislodged rocks 	<ul style="list-style-type: none"> Report injuries to buddy for first aid if necessary. Come to work alert and ready—make sure that general awareness of site surroundings is part of job planning and execution. Wear heavy work gloves when handling sharp objects, and point sharp objects toward the ground. Do not walk at the edge of sharp drop-offs. Maintain special care on scree slopes or while working in other areas with unstable footing. Maintain general awareness of surroundings. Be aware of the possibility of abandoned underground mine portals. Avoid areas below people who may dislodge rocks while working or walking on slopes. Cry “ROCK” after dislodging a rock when other people are below. 	Minimum: hard-hat, boots, long pants, and cotton shirt; heavy work gloves for handling sharp objects.

Appendix A—Activity Hazard Analysis

Tasks	Hazards	Controls	PPE Required
Sampling at Inactive Mine Sites (continued)	<ul style="list-style-type: none"> Deteriorated roads 	<ul style="list-style-type: none"> Receive site-specific hazard training. Exercise care while traveling by vehicle. 	
	<ul style="list-style-type: none"> High wall collapse or rock-fall 	<ul style="list-style-type: none"> Receive site-specific hazard training. Know signs of instability. Carefully examine the surroundings to determine if entry is safe. Be aware of the most efficient evacuation route. Do not walk on top of high walls. Avoid working downslope of rock slides. 	
	<ul style="list-style-type: none"> Heat or cold stress Drinking water from mine pits 	<ul style="list-style-type: none"> Monitor for heat and cold stress as outlined in the Health and Safety Plan (see Section 7.0). Water in mine pits is of unknown quality, and WILL NOT be used for drinking water. Water purification with iodine, filters, or boiling will not remove potentially toxic metals. 	
Travel in Remote Areas	<ul style="list-style-type: none"> General 	<ul style="list-style-type: none"> Always carry ten essentials for wilderness travel (see Table 2-3). 	Heavy work gloves for handling sharp objects.
	<ul style="list-style-type: none"> Slips/trips/falls 	<ul style="list-style-type: none"> Maintain general awareness of surroundings. 	

Tasks	Hazards	Controls	PPE Required
Travel in Remote Areas (continued)	<ul style="list-style-type: none"> Cuts and scrapes 	<ul style="list-style-type: none"> Report injuries to buddy for first aid. Come to work alert and ready—make sure that general awareness of site surroundings is part of job planning and execution. Wear heavy work gloves when handling sharp objects, and point sharp objects toward the ground. 	
	<ul style="list-style-type: none"> Safe drinking water 	<ul style="list-style-type: none"> Contact National Forest officials in advance regarding any water quality advisories. Bring sufficient water. Assume that you will need one gallon of drinking water per person per day. 	
	<ul style="list-style-type: none"> Severe weather 	<ul style="list-style-type: none"> Bring proper rain gear and warm clothes. Listen to weather forecasts before entering remote areas. If severe weather is likely, postpone sampling. In case of lightning, avoid high ground and open areas. In the event of rain, monitor for hypothermia. In the event of snow, monitor for frostbite and hypothermia. In the event of a blizzard that reduces visibility, stay put in an emergency shelter. Do not risk disorientation. 	

Tasks	Hazards	Controls	PPE Required
Travel in Remote Areas (continued)	<ul style="list-style-type: none"> Getting lost 	<ul style="list-style-type: none"> Provide the Program Manager or designee with itineraries, including travel routes and the expected date and time of return. Check in once per day, if possible, when in remote areas. Always check in with the Program Manager or designee before and after sampling. The Program Manager or designee will contact search and rescue if field personnel do not return or call in by the specified time. Bring emergency shelter. If lost, stay put. You are easier to find this way. 	
	<ul style="list-style-type: none"> Heat or cold stress 	<ul style="list-style-type: none"> Monitor for heat or cold stress as outlined in the Health and Safety Plan (see Section 7.0). 	
	<ul style="list-style-type: none"> Muscle strains 	<ul style="list-style-type: none"> Know your limits, and do not overextend yourself. 	
	<ul style="list-style-type: none"> Poisonous plants and animals 	<ul style="list-style-type: none"> Be able to recognize poisonous plants and animals and avoid them. If bitten by a snake or spider, apply cold compresses. Get to a hospital as quickly as possible. 	
	<ul style="list-style-type: none"> Wildlife 	<ul style="list-style-type: none"> Avoid, if possible, and leave the area. Make yourself look large by raising arms and shouting. Slowly back away, without turning your back to the animal. 	

Appendix A—Activity Hazard Analysis

Tasks	Hazards	Controls	PPE Required
General Work Practices	• First aid injuries	<ul style="list-style-type: none"> • Report injuries to buddy for first aid. • Seek additional medical attention, if necessary. • Notify the PSO. 	Minimum: hard-hat, safety glasses, boots, long pants, and cotton shirt.
	• Slips/trips/falls	<ul style="list-style-type: none"> • Practice good housekeeping, and remove or reduce slip/trip/fall hazards. • Maintain general awareness of surroundings. 	Additional: heavy work gloves and hearing protection, as necessary.
	• Cuts/scrapes	<ul style="list-style-type: none"> • Report injuries to buddy for first aid. • Come to work alert and ready—make sure that general awareness of site surroundings is part of job planning and execution. • Wear heavy work gloves when handling sharp objects and point sharp objects towards the ground. 	
	• Heat or cold stress	<ul style="list-style-type: none"> • Monitor for heat and cold stress as outlined in the Health and Safety Plan (see Section 7.0). 	
	• Muscle strain	<ul style="list-style-type: none"> • Alternate activities as needed to give muscles rest. 	
	• Slips/trips/falls	<ul style="list-style-type: none"> • Practice good housekeeping to remove or reduce slip/trip/fall hazards. 	
	• Hearing loss.	<ul style="list-style-type: none"> • Use hearing protection when operating loud equipment. 	

Appendix A—Activity Hazard Analysis

Tasks	Hazards	Controls	PPE Required
General Work Practices (continued)	• Electrocution.	• Use GFCI on portable power equipment.	
	• Power equipment	• See manufacturers instructions for the use of hand and portable power tools.	

APPENDIX B

MWH EH&S PROCEDURE NO. 811, DRILLING SAFETY

811 DRILLING SAFETY

I. PURPOSE

This procedure provides information on the hazards, regulatory requirements, and safe work practices for using drilling equipment and performing drilling operations. This procedure address all forms of drilling, including cable tool, rotary, geo-probe, roto-sonic, and hollow-stem auger drilling used for most geotechnical, investigation, groundwater, and subsurface exploration drilling projects.

II. REGULATORY REVIEW

There are no specific Occupational Safety and Health Administration (OSHA) regulations for drilling activities; however, general guidelines may be found in 29 CFR 1926.800, *Underground Construction*, section (q). In addition, some of the OSHA standards that are applicable to drilling operations include:

29 CFR 1926, Subpart E, *Personal Protective and Lifesaving Equipment*
29 CFR 1926.65, *Hazardous Waste Operations and Emergency Response*
29 CFR 1926.251, *Rigging Equipment for Material Handling*
29 CFR 1926.307, *Mechanical Power-transmission Apparatus*.
29 CFR 1926.550, *Cranes and Derricks*
29 CFR 1926, Subpart Z, *Toxic and Hazardous Substances*

Some state OSHA plans may have additional requirements for drilling. Also, the client may have specific permits or operation practices that will be applicable to MWH drilling operations. Contact the Regional ES&H Manager for additional information.

Additional information may be obtained from the following non-regulatory references:

- ATEC Associates, Inc. 1991. *Drilling Safety: Working in the Danger Zone*.
- Diamond Core Drill Manufacturers Association (DCDMA) and the National Drilling Contractors Association (NDCA). *Drilling Safety Guide*. National Drilling Federation.
- Driscoll, Fletcher. 1989. *Groundwater and Wells*.
- West Hazmat Drilling. 1991. *Workplace Injury & Illness Prevention Program*.
- U S Army Corps of Engineers, EM385-1-1, *Safety and Health Requirements* Chapter 16.

III. ROLES AND RESPONSIBILITIES

A. ES&H Director

The ES&H Director is responsible for establishing a program that provides for the protection of MWH employees and subcontractors and that meets the applicable regulatory requirements for the use of, and work adjacent to, drilling equipment.

B. Regional ES&H Manager

The Regional ES&H Manager is responsible for:

- Ensuring that this procedure is implemented within his or her region.
- Ensuring assessments are completed to verify compliance with regulatory and procedure requirements.

C. ES&H Representative

The ES&H Representative is responsible for the following:

- Evaluating work sites and activities to ensure drilling operations are conducted in compliance with the requirements of this procedure and regulatory standards.
- Verifying that equipment inspections are completed and that equipment used is in serviceable condition.
- Verifying that employees are following safe work practices for work with, and adjacent to, drilling operations.

D. Employee

Each employee is responsible for the following:

- Understanding the hazards and following the required safe work practices for drilling operations.
- Using the personal protective equipment (PPE) specified for the task being performed.

IV. DEFINITIONS

Annulus: The space between the drill string (length of connected drill pipe) or casing and the wall of the borehole or outer casing.

Auger Drilling: A general type of drilling in which the borehole is drilled by rotating augers (either hollow-stem or solid-stem), and cuttings are removed by being pushed up the "flights" (corkscrew-like flanges) of the augers. (Note: the term "flight" is often used to indicate the lengths of hollow-stem or solid-stem augers, as well as the flanges on the augers.) Hollow-stem augers allow drillers to send split-spoon samplers down through the center of the augers, thereby eliminating the need to pull out the augers first. Solid-stem augers are used for smaller-diameter holes and for drilling through formations where more concentrated downward force is necessary.

Bit: The cutting tool attached to the bottom of the drill string. Used in rotary drilling.

Blowout: An uncontrolled escape of drilling fluid, gas, oil, or water from the well caused by the formation pressure being greater than the hydrostatic head of the fluid in the borehole. Also, an uncontrolled escape of grout from the borehole or well caused by malfunctioning pressure grouting apparatus.

Cone Penetrometer Testing (CPT): This was originally a method of performing geotechnical evaluations of subsurface soils, now additionally used to obtain rough estimates of aquifer properties. The CPT rig uses a direct-push method to advance a cone equipped with electronic sensors. As the cone is pushed downward, measurements are collected by the sensor and are recorded on the CPT aboveground equipment. Some CPT rigs are also capable of collecting soil gas, soil and groundwater samples at shallow depths (usually less than 50 feet).

Cuttings: Formation particles obtained from a borehole during the drilling process.

Direct-Push Soil Gas/Soil/Groundwater Sampling: A method of sampling either soil gas, soil, or groundwater by advancing a small sampling probe. The probe is hydraulically pushed downward, generating virtually no cuttings and eliminating waste disposal concerns. Direct-push sampling is applicable where no permanent wells are desired, and/or where sampling is required at relatively shallow depths (usually less than 50 feet). Direct-push equipment may be truck-mounted (on a vehicle), or mounted on a modified hand truck.

Drill Collar: A length of extremely heavy steel tube. It is placed in the drill string immediately above the bit to minimize bending caused by the weight of the drill pipe.

Drill Pipe: A special pipe used to transmit rotation from the rotating mechanism to the bit. The pipe also transmits weight to the bit and conveys air or fluid, which removes cuttings from the borehole and cools the bit.

Drilling Fluid or Mud: A water-based or air-based fluid used in the well drilling operation to remove cuttings from the borehole, to clean and cool the bit, to reduce friction between the drill string and the sides of the borehole, and to seal the borehole.

Grouting: The operation by which grout is placed between the casing and the sides of the borehole to a predetermined height above the bottom of the well. This secures the casing in place and excludes water and other fluids from the borehole. A pressure grouting operation injects grout from the surface under high pressure, in order to move grout laterally in the subsurface and ensure an adequate seal.

Kelly: A hollow steel bar or pipe that is the main section of drill string to which the power is directly transmitted from the rotary table to rotate the drill pipe and bit. The cross section of the kelly is either square, hexagonal, or grooved. The kelly works up and down through drive bushings in the rotary table.

Limited Access Drill Rig: A type of drill rig, usually equipped with solid-stem augers, which allows drilling in tight spaces or in areas with low overhead clearance (less than 12 feet). Limited access drill rigs may be mounted on a small lawnmower-like vehicle, or on a modified hand truck.

Rotary Drilling: A general type of drilling in which the borehole is drilled by rotating a bit, and cuttings are removed by continuous circulation of a drilling fluid (e.g., mud, water, air, foam) as the bit penetrates the formation. The bit is attached to the lower end of a string of drill pipe, which transmits the rotating action from the rig to the bit.

Rotary Table: A mechanical or hydraulic assembly that transmits rotational torque to the kelly, which is connected to the drill pipe and the bit. The rotary table has a hole in the center through which the kelly passes.

Split-Spoon Sampler: A thick-walled steel tube split lengthwise used to collect soil samples. The sampler is commonly lined with metal sample sleeves and is pounded or pushed downhole by the drill rig to collect samples.

V. PLANNING

A. Training

Only trained and experienced personnel who are familiar with the use, limitations, and maintenance requirements of the equipment are permitted

to operate the drill rig. The drill rig must be operated in accordance with the manufacturer's instructions and recommendations.

The drill crew shall be familiar with the hazards associated with the drilling operations, personal protective equipment requirements, location of emergency stops, site-specific safety requirements, and the content of this procedure.

Additional training requirements may be required based on the location of the drilling activities. This training may include:

- Hazardous Waste Operations training if work is conducted at a hazardous waste site.
- Waste management training, where waste streams (e.g., drill cuttings, purge water, decontamination water, contaminated personal protective equipment) will be generated.

Site-specific training requirements will be outlined in the project-specific HASP.

B. Medical Surveillance

There are no medical surveillance requirements specific to drilling activities. However, drilling at hazardous waste sites that involve toxicological hazards may require medical surveillance.

Medical surveillance requirements will be addressed in the Project HASP.

MWH drilling subcontractors are responsible for ensuring that their employees receive medical surveillance as required.

C. Safety Equipment

MWH will provide required PPE and safety equipment for its employees and operations. Subcontractors are responsible for providing all PPE and safety equipment necessary for safe operation. Safety equipment will be provided by the subcontractor as delineated in the subcontract and referenced documents. The minimum safety equipment for drilling activities includes safety-toed boots, hard hats, and safety glasses with side shields. Other safety equipment that may be required for drilling operations includes:

- Hearing protection when working in proximity to drilling machinery.
- Body protection (e.g., gloves and protective coveralls) when chemical hazards exist.

- Detection equipment shall be provided if the exact location of underground utilities cannot be determined.
- Air monitoring instruments shall be provided if the potential for a hazardous atmosphere exists in the drilling location.
- High-visibility warning vests are to be worn by all workers exposed to vehicle traffic.
- Fall protection equipment is required if working from unprotected platforms or surfaces greater than 6 feet above the lower level.

D. Subcontractor Selection and Oversight

The *Subcontractor Safety Program Review Criteria—Drilling Operations*, Attachment A, provides the minimum criteria for subcontractor drilling safety procedures. These criteria will be used by the ES&H Representative or ES&H Staff to review subcontractor programs and procedures

Responsibilities for environment, safety and health are expressly defined in the subcontract terms and conditions, and MWH's ES&H practices in the field are determined based on these defined responsibilities. MWH employees shall not direct the means and methods of the subcontractor's operations or direct the details of corrective actions except when MWH employees are responsible for the work activity by contract.

E. Planning Activities

Depending on the contract with the client, the subcontract with a drilling subcontractor, and the physical location of the drilling operation, MWH, may be responsible for some of the following functions to support drilling operations. The responsible party for these items should be clearly defined in the contract and subcontract requirements and included in the Project ES&H Plan.

1. Utility Location

The location of underground utilities, such as electric, fuel, water, cable, telephone, and sewer (either in service or abandoned), and underground installations such as foundations, underground storage tanks, piping, and any other structures need to be identified before drilling is permitted. Utility companies and/or installation owners shall be contacted to provide exact locations of their equipment or structures. Some states have a one-call phone number for locating underground utilities. Most utilities and call

centers require a minimum 48-hour-notice (excluding Saturdays, Sundays, and holidays) to identify utilities before drilling work can begin.

If underground utilities cannot be positively located, or where drilling is performed in areas known or suspected to contain buried objects (e.g. drums, tanks, or cylinders), the area will be surveyed with the aid of audio and radio frequency transmitters and receivers, ground penetrating radar, ultrasonic testing, metal detectors, or other means necessary to ensure safe drilling operations.

Overhead electrical transmission and communication lines also need to be identified. If any portion of the drill rig will be within: 10 feet of electrical lines up to 50kV or 10 feet plus 4 inches for every 10 kV over 50 kV, the utility or other facility operating the system will be contacted to have the lines de-energized.

Access to the work location will also be evaluated. Where rigs must travel under energized electrical lines, clearance will be 4 feet for voltages up to 50kV; 10 feet for voltages over 50kV and up to 345kV; and 16 feet for voltages from 345kV up to 750kV.

2. Permits

The following permits and notifications may be required, depending on state, local, and client requirements. The Regional ES&H Manager should be contracted for assistance in determining applicability.

- Well driller license/certification or Professional Geologist requirements: MWH subcontractors will be required to submit licenses or certifications before subcontract award, where applicable.
- Well installation or abandonment notification: Submittal of a well log or inventory may be required after installation or abandonment.
- A groundwater withdrawal permit may be required for large water withdrawals in some states.
- A "drilling permit" may be required at certain client facilities.

3. Waste Management

Drill cuttings and purge water from uncontaminated soil or ground water shall be appropriately.

When drilling is conducted at hazardous waste sites, the Regional ES&H Manager or designee may be consulted on the proper evaluation, disposal, and decontamination procedures involving potential hazardous waste.

- All waste generated shall be evaluated for appropriate disposal and handled in accordance with the appropriate waste management procedure.
- If drilling involves hazardous waste, MWH decontamination procedures shall be followed. No potentially contaminated equipment shall be permitted to leave the work site.

4. Drilling at Ordnance Explosives (OE) or Unexploded Ordnance (UXO) Sites

If the project site is suspected of OE contamination, the requirements of the ES&H procedure for *Unexploded Ordnance, Open Firing Ranges, and Chemical Warfare Agents*, shall be followed. The following procedures will be implemented, at a minimum:

- Drilling operations on OE sites will not be conducted until a complete plan for the site is prepared and approved by MWH ES&H, and the UXO Safety Officer. OE/UXO avoidance must be conducted during drilling operations on known or suspect OE sites.
- The UXO team will identify and clearly mark the boundaries of a clear approach path for the drilling crews, vehicles, and equipment to enter the site. This path will be, at a minimum, twice the width of the widest vehicle. No personnel will be allowed outside any marked boundary.
- If OE is encountered on the ground surface, the UXO team will clearly mark the area where it is found, report it to the proper authorities, and divert the approach path around it.
- The UXO team will conduct an access survey using the appropriate geophysical instrument over the approach path for avoidance of OE that may be in the subsurface. If a magnetic anomaly is encountered, it will be assumed to be OE and the

approach path will be diverted around the anomaly. Only UXO personnel will operate the appropriate geophysical instrument and identify OE.

- An incremental geophysical survey of the drill hole location(s) will be initially accomplished by the UXO team using a hand auger to install a pilot hole. If OE is encountered or an anomaly cannot be positively identified as inert material, Hazardous Toxic Radiological Waste sampling personnel will select a new drill hole location.
- Once a drilling site has been surface cleared and a pilot hole established as described above, the drilling crew or subcontractor will be notified that the site is available for subsurface drilling.

VI. PROCEDURE

A. Safe Work Practices

Only authorized or licensed personnel, based on applicable state or local requirements, shall be permitted to operate drill rigs.

When moving large equipment in a confined area, spotters shall be used. The spotter and equipment operator must use standard hand signals for communication. Spotters shall never place themselves between equipment and fixed structures or equipment.

Drill site work areas shall be demarcated to deter unauthorized individuals from entering the work area.

Personnel not involved in equipment operation shall remain clear of drill rigs.

Personnel shall stay clear of the rotating augers and other rotating components of drill rigs at all times. Stand to the side while tripping and tailing rods and augers. Never stand under the rod/auger or between the rig and service truck while tripping rods or augers.

Stay as clear as possible of all hoisting operations. Loads shall not be hoisted over personnel. Never work around or under drilling rods or augers being hoisted.

Keep footwear and work area free of mud and drilling fluids. Maintain 3 points of contact when mounting and dismounting a drill rig. Do not climb the drill rig mast without the use of fall protection.

Augers shall not be stored standing up and shall be secured from rolling.

Hand tools shall be inspected before use. Wrench jaws must be periodically inspected and replaced when necessary.

Understand and be aware of all pinch points including breakout wrenches, pull down cables, and pulling jacks. These points should be color-coded. Experienced employees must show new employees these pinch points on the first day of work.

Good housekeeping shall be maintained at all times. Litter will be properly stored, and hand tools and other hardware will be properly secured on the drill rig. Before moving a drill rig, a check shall be made for loose tools and hardware.

All work areas, platforms, walkways, scaffolding, and other accessways should be maintained free of materials, debris, obstructions, and substances, such as ice, grease, or oil.

Drill rods and augers should be placed on dunage and secured to prevent movement. Always use a sling or strap while manually handling rods and augers.

Be aware of your footing to prevent slips, avoid stepping between rods and augers to prevent crushed ankles from their movement.

Do not wear loose-fitting clothing or other items, such as rings or watches, that could get caught in moving parts. Individuals with long hair should have it restrained.

Personnel shall not smoke around drilling operations.

Personnel shall wear the appropriate PPE. Minimum protection includes safety-toed boots, hard hats, safety glasses, and hearing protection.

A daily safety briefing shall be conducted with all work site personnel to discuss the work planned for the day and the ES&H requirements.

Unattended boreholes shall be covered or protected to avoid the possibility of animals or people accidentally falling into them.

Wellheads on roads and parking lots should be flush-mounted.

B. Site Preparation

Verify that underground utilities and structures have been located and marked, and overhead utilities de-energized as required.

As applicable, the drilling site shall be prepared, cleared, and leveled, particularly on steep slopes or areas that are covered with dry dead grass and weeds. Care should be taken in constructing pads if extensive cutting into existing slopes or surfaces is required to level the area. Areas where extensive fill is required should be avoided. Compaction is recommended if significant amounts of fill are needed; the ground must be capable of supporting the impact imposed by the drill rig and associated equipment. Clean fill or gravel can be brought in to cover areas with surface contamination.

Before drilling equipment is mobilized to the drilling pad, the travel route shall be surveyed for overhead and terrain hazards. Access roads shall be designed, constructed, and maintained to safely accommodate the movement of the drill rig and other equipment.

Material Safety Data Sheets (MSDSs) shall be available for all drilling fluids, grout, bentonite, or other substances used in the drilling process.

C. Drill Rig Requirements

All self-propelled drill rigs shall be equipped with the following safety features:

- Seatbelts,
- Multipurpose dry chemical fire extinguisher rated at not less than 2A:10B:C
- Multidirectional alarm
- Operator's Manual
- Horn
- Lights
- Other warning devices specified by the manufacturer

Self-propelled off-road drill rigs will be equipped with roll-over protective structures (ROPS) meeting Society of Automotive Engineers requirements.

The drilling equipment shall be equipped with two easily accessible emergency shutdown devices.

Control levers on the drill rig shall be clearly labeled indicating the function and direction of the movement.

All machine guards shall be in place while the rig is in operation.

Where drill rigs are equipped with a platform, the platform shall be constructed from material strong enough to support the weight of the load that will be placed on the platform. The platforms shall be accessed using a ladder or steps. Platforms over 6 feet above ground surface shall be equipped with a guardrail system that includes a toeboard.

The drill rig and associated equipment shall be inspected each day before use by a qualified mechanic or an operator knowledgeable of the specific equipment. Inspections and tests will be conducted in accordance with the manufacturer's recommendations. A written record of the inspections shall be kept on the equipment or in a project file. Consideration shall be given to the following items in the performance of equipment inspections.

- Missing nuts, bolts, pins, loose fittings and couplings.
- Cracked paint, frayed cables and hoses, evidence of fluid leakage on equipment or ground, and loose tracks and pads.
- Fluid levels in the battery, hydraulic system, brake system, and cooling systems; engine lubrication; and fuel supply. CAUTION: Never use your hands to check for hydraulic leaks. An open flame shall not be used to check fluid levels or look for leaks.
- Condition of glass in cab clean and not broken, gauges checked for proper function and readings; test of brake lights, horn, backup alarm, steering, and other controls.
- All emergency shutdown and warning systems to ensure that they are working correctly.

When deficiencies that affect the safe operation of equipment are identified, the equipment will be immediately taken out of service until unsafe conditions are corrected. A "DO NOT OPERATE" tag indicating that the equipment is not to be operated will be placed on the operator controls. When required or necessary, lockout procedures will be used. When corrections are made, the equipment will be re-tested for safe use before being returned to service.

D. Equipment Travel and Set-up

Safe clearances from overhead electrical transmission lines shall be maintained.

The operator shall ensure ground is stable and that grades, especially side traverses, are within the operating limits of the vehicle.

The mast shall be lowered and rig placed in appropriate configuration for travel. Drilling equipment shall not be transported for even a short distance with the mast up.

The drill rig must be leveled and stabilized with leveling jacks. Cribbing shall be used as necessary. Outriggers shall be extended per the manufacturer's specifications. Cribbing materials should be made from materials that are capable of supporting the weight of the rig. Care should be taken in muddy, soggy soils, or partially frozen areas. In addition to cribbing, guy wires should be used as required by the manufacturer to improve stability if the rig is located on wet, partially frozen ground, or in areas with loose, caving soil, or in an area subject to frequent gusty winds.

Prior to raising the mast (derrick) the operator shall look up for overhead obstructions. The drill rig operator shall verify that all personnel are cleared from the area immediately to the rear and the side of the mast.

Unsecured equipment shall be removed from the mast and cables; mud lines and cat line rope must be secured before raising the mast.

Before starting drill operations, the mast shall be secured and locked in accordance with the manufacturer's recommendations.

E. Equipment Operation

The drill rig shall be provided with a "kill" switch that, when activated, will shut down the rig. The switch should be clearly identified and tested daily to confirm operational status. All drilling crew members should be made aware of the location and purpose of this switch.

The rope, wire rope, or cable on the drill rig should never be wrapped around any part of the body.

The drill rig should not be operated during severe inclement weather, such as lightning storms, high winds, or severe rain. The mast should be lowered during these conditions.

Before starting, the operator shall verify that all gear boxes are in neutral; all hoist levers are disengaged; hydraulic levers are in the correct non-actuating positions; and the cathead rope is not on the cathead.

The operator shall verbally alert workers and visually verify that workers are clear from the dangerous parts of equipment before starting the equipment.

Drill crew members shall not wear loose clothing or clothing with loose ends, straps, drawstrings, belts, or otherwise unfastened parts that might catch on rotating or translating components of the drill rig. Rings and jewelry shall not be worn during a work shift.

The drill rig shall always be operated from the control panel. The operator must never leave the control panel while the drill is in operation. Only one person should operate the machine. If the operator must leave the area of the controls, the operator must shift the transmission controlling the rotary drive into neutral and place the feed control level in neutral. The drill rig shall be shut down before the operator leaves the vicinity of the drill.

Pressurized lines, such as airlines, mud hose, etc. shall be equipped with safety-type couplings and secured with wire or chain at each coupling to prevent whipping in the event of failure. Lines and safety connection shall be inspected daily. Pressurized lines shall not be disconnected until shut off and bled to reduce the pressure.

Drilling fluid discharges shall be channeled away from the work area to prevent the accumulation of water. Mud pits and drainage channels should be safely sloped and located to provide minimum interference with the work. Where necessary, suitable barricades or temporary fencing should be provided to protect the work area and reduce the possibility of injury to persons.

Where compressed air drilling is conducted, the exhaust shall be directed into an approved dust collection system. The cuttings shall be directed to the side away from employees. Workers shall be required to use protective clothing and respiratory protection, when required.

1. Tool Handling – Hoist Line

All wire ropes and rigging hardware shall be thoroughly inspected before use. Defective equipment shall not be used. Shop fabricated rigging or hooks without latches are not permitted. Where a chain sling is used, it shall be an alloy chain and shall be properly labeled.

Hoist and rigging hardware shall be used only for their designated intent and shall not be loaded beyond their rated capacity. Steps shall be taken to prevent two-blocking of hoist.

The tool handling hoist shall only be used for vertical lifting of tools. The tool hoist must not be used to pull on objects away from the drill rig, unless specifically designed for that purpose.

Drill rods shall be neither run nor rotated through rod slipping devices: no more than 1 foot of drill column shall be hoisted above the top of the drill mast. Drill rod joints shall not be made up, tightened, or loosened while a rod-slipping device supports the rod column.

Chuck jaws shall not be used to brake a string of drill rods while being lowered into the hole. A cat line or hoisting cable or plug should be used for braking before tightening the chuck.

- Drilling rods shall not be lowered into the hole with a pipe wrench.
- When stuck tools or similar loads cannot be raised with a hoist, disconnect the hoist line and connect the stuck tool directly to the feed mechanism of the drill. Do this only when the rope is secured with a wrench or dog collar. Do not use hydraulic leveling jacks for added pull to the hoist line or feed mechanism of the drill.

Loads shall not be hoisted over the head, body, or feet of any person. Loads shall not be left suspended when the hoist is unattended. Work is not permitted under a suspended load.

Hoist lines shall not be used to ride up the mast of a drill rig.

When wire rope hoist lines are used, the following precautions shall be followed:

- Wire rope must be properly matched with each sheave. (If too large, the rope will pinch; if too small, the sheave will groove. Once a sheave is grooved, it will pinch and damage the larger rope.)
- Most sheaves on rigs are stationary and designed for a single-part line. Never increase the number of sheaves, winch lines, or part lines unless approved by the drill manufacturer.
- Minimize the shock to wire rope. Pull loads smoothly and steadily, especially in cold weather. Never use frozen ropes.
- Protect wire rope from sharp corners and edges. Replace faulty guides and rollers.
- When handling wire rope, always wear gloves. Do not guide rope onto hoist drums with your hands. Replace the wire rope

according to manufacturer's specifications. When new rope is installed, first lift a light load to allow the rope to adjust.

2. Auger Drilling

Use an auger guide to facilitate the starting of a straight hole through hard ground or pavement, as applicable. Apply an adequate amount of down pressure before rotation to seat the auger head below the ground surface.

The operator and tool handler shall establish a system of responsibility for the series of activities required for auger drilling, such as connecting and disconnecting auger sections, and inserting and removing auger fork.

The operator shall verify that the tool handler and others are clear from the auger column and that the auger fork is removed before starting rotation.

The manufacturer's recommendations must be followed for securing the auger to the power coupling. Workers shall not touch the coupling or the auger with their hands, a wrench, or any other tools during rotation.

Only tight-fitting pins designed for the auger shall be used to secure auger flights. The use of mismatched augers shall be avoided.

Augers shall be cleaned only when the rotating mechanism is in neutral and the auger stopped. Long-handled shovels may be used to move auger cuttings away from the auger.

Workers shall not place their hands or fingers under the bottom of auger section when hoisting the auger over the top auger section in the ground or over hard surfaces such as drill rig platform.

Workers shall, stay clear of the rotating auger and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason.

3. Cathead Operations

The cathead shall be inspected before use. Inspection shall be made with the engine off. The cathead shall be kept clean and free of rust, oil, and grease. When 1/8-inch or greater rope groves form, the cathead should be replaced. In wet or icy conditions, a cathead cannot be used.

Always use a clean, dry rope. An oily rope may grab on the cathead. Never use a rope that is longer than necessary.

If the rope grabs or tangles, alert personnel to back away and stay clear. If tools are suspended, carefully shutdown the drill and back away. Once you have resolved the situation, the drill may be restarted and the tools lowered to safety.

Hoist lines shall be positioned to prevent contact with the cathead rope.

The following precautions shall be used to prevent cathead incidents:

- The operator should be on a level surface with firm footing.
- Do not wear loose clothing or gloves with loose straps or cuffs.
- Never wrap the rope around your hand, wrist, arm or other body parts. Never stand on the end of the cathead rope.
- Maintain a distance of 18 inches clearance between operating hand and drum.
- Be aware, the rope advances with each hammer blow.
- Do not leave a cathead unattended with the rope wrapped on the drum.

4. Rotary and Core Drilling

Water swivels, hoist plugs, rod chuck jaws etc. shall be inspected before use. Defective equipment shall not be used.

Only the operator of the drill rig shall brake or set a manual chuck so that rotation of the chuck will not occur before removing the wrench from the chuck.

Chuck jaws shall not be used to brake drill rods while lowering rods into hole. Drill rods shall not be held or lowered into the hole with pipe wrenches. If a string of drill rods are accidentally or inadvertently released into the hole, no attempt shall be made to grab the falling rods with hands or a wrench.

When drill rods are hoisted from the hole, they shall be cleaned to facilitate safe handling. The hand should not be used to clean drilling fluids from drill rods.

Drill rods shall never be lifted and leaned unsecured against the mast. Drill rods shall be secured to the upper ends of the drill rod sections for safe vertical storage or shall be laid horizontally.

In the event of a plugged bit or other circulation blockage, the pressure in the piping and hose between the pump and the obstruction should be relieved or bled down before breaking the first tool joint.

The spinning chain is very powerful and must be treated with respect. Spinning chains must have a rope tail. Communication between the driller and tool handler is required for safe operation of the spinning chain.

If freezing weather is expected, all air and water lines should be drained when not in use.

F. Drill Rig Maintenance

Components found to be in defective condition, either during inspections or during rig operation, should be repaired immediately.

Rig maintenance shall only be performed after appropriate lockout/tagout procedures have been implemented.

The cathead should be kept clean and free of rust, oil, and grease. The cathead should be cleaned with a wire brush if it becomes rusty.

Drilling operations may require repair or disentanglement of wire rope on the mast while it is raised. Fall protection shall be used when personnel are exposed to a fall of 6 feet or greater.

Augers should be cleaned only when the drill rig is in neutral and the augers have stopped rotating. Hands or feet should not be used to move cuttings away from the auger.

G. Self-Assessment Checklist

The *ES&H Self-Assessment Checklist – Drilling* provides a method of verifying compliance with established regulations, safe work practices, and industry standards pertaining to drilling operations. The MWH ES&H Representative or ES&H staff may use this checklist when MWH

employees and/or MWH Subcontractors are performing drilling operations or are exposed to the hazards of activities involving drilling.

VII. ATTACHMENTS

- Attachment A: *Subcontractor Safety Program Criteria – Drilling Operations*
Attachment B: *ES&H Self-Assessment Checklist – Drilling Operations*

**Drilling Operations
ES&H Procedure – 811
Attachment A**

Subcontractor Safety Program Criteria – Drilling Operations

ATTACHMENT A

Subcontractor Safety Program Criteria – Drilling Operations

The following criteria are not intended to be all-inclusive, but are provided as a tool to facilitate review of subcontractor safety procedures. Subcontractors are expected to address the following items, at a minimum, in their safety procedures.

Minimum Acceptable Criteria for Subcontractor Drilling Safety Procedures:

1. Provide name and qualifications of the drilling "competent person" responsible for drilling (years and type of experience, training background, etc.).
2. Describe drill rig and equipment inspection criteria or procedures (frequency of inspections, visual vs. written inspections, items that are inspected).
3. Describe methods of identifying underground utilities (contacting utility companies, detection equipment).
4. Describe methods of avoiding contact with overhead power lines (de-energizing and grounding, insulating, safe clearance distances).
5. Describe methods to identify hazardous atmospheres and controls used to eliminate (detection equipment and controls).
6. Describe leveling and stabilizing methods for drill rig (drilling pad, jacks, cribbing, guy wires).
7. Verify that rig equipment is in good operational condition (including "kill" switch, cathead, ropes, pressurized hoses and lines, operator controls, machine guards, and drilling tools).
8. Describe procedures for operating in inclement weather, including lightning, high winds, and severe rain storms.
9. Describe other safe work practices for equipment operation (drill rig, equipment, tools, rig transportation, rig travel).
10. Describe on-the-job maintenance procedures, including lockout/tagout.
11. Describe safe work practices for other activities to be performed during this project (use of ladders, fall protection, electrical power tools, personal protective equipment, etc.).
12. Describe methods for disposal of non-hazardous drill cuttings and purge water (including accumulation, transport, and disposal).
13. If hazardous waste project, provide documentation of hazardous waste worker training and medical surveillance records for all project personnel (40-hour or 24-hour training, 8-hour refresher training) and describe methods of hazardous waste management (including accumulation, transport, and disposal).
14. Submit a copy of drilling license/certification and drill rig permit.
15. Describe methods and responsibilities for submittal of notifications and logs.
16. Complete the Waste Subcontractor Qualification form for each proposed transport and disposal facility.
17. Describe procedures for drilling site cleanup upon job completion.

If drilling in areas with known or potential Ordinance Explosives (OE)/Unexploded Ordnance (UXO) hazards:

18. Provide documentation of UXO qualifications, hazardous waste worker training, and medical surveillance records for all project personnel (40-hour or 24-hour training, 8-hour refresher training).
19. Describe procedures for OE avoidance, identification and marking the boundaries of a clear approach path and work site for the sampling crews, vehicles, and equipment to enter the site.
20. Describe the procedures for drilling and monitoring and the process for encountered OE.



**Drilling Operations
ES&H Procedure – 811
Attachment B**

ES&H Self-Assessment Checklist – Drilling Operations

ATTACHMENT B

Self-Assessment Checklist – Drilling Operations

This checklist shall be used by MWH personnel only and may be completed at the frequency specified in the Project HASP or by the ES&H Representative.

This checklist is to be used at locations where (1) MWH employees and/or (2) MWH subcontractors are working on projects involving drilling operations.

During evaluation of MWH subcontractors, the ES&H Representative may consult with subcontractors when completing this checklist, but shall not direct the means and methods of operations nor direct the details of corrective actions unless provided for by contract requirements. Subcontractors shall determine how to correct deficiencies.

If deficiencies are identified that are considered imminent danger (possibility of serious injury or death) hazards, they shall be corrected immediately or all exposed MWH and MWH subcontract personnel shall be removed from the hazard until corrected.

Completed checklists shall be maintained in project ES&H Files.

Project Name: _____ Project No.: _____

Location: _____ PM: _____

Evaluator: _____ Title: _____ Date: _____

This specific checklist has been completed to:

- ☐ Evaluate MWH employee compliance with requirements
- ☐ Evaluate an MWH subcontractor's compliance with requirements

Check "Yes" if an assessment item is complete/correct.

Check "No" if an item is incomplete/deficient, section 2 must be completed for all items checked "No."

Subcontractor deficiencies shall be brought to the immediate attention of the subcontractor.

Check "N/A" if an item is not applicable

Check "N/O" if an item is applicable, but was not observed during the assessment



ATTACHMENT B

Self-Assessment Checklist – Drilling Operations

	Yes	No	N/A	N/O
Section 1				
SAFE WORK PRACTICES				
1. Only authorized, licensed operators meeting local requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Spotters used for equipment in constricted areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Drill site work area demarcation in place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Personnel cleared during rig startup.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Personnel clear of rotating parts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Personnel not positioned under hoisted loads.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Augers and drill strings stored properly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Good Housekeeping maintained on rig and work site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Loose clothing and jewelry removed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Smoking is prohibited around drilling operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Personnel wearing appropriate personal protective equipment (PPE).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Daily safety meeting completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Traffic control in place, where required.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Preparation				
14. Underground utilities & structures identified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Drill site prepared for rig.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Travel routes surveyed for obstruction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Required MSDSs on site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drill Rig Requirements				
18. Drill rig equipped with emergency stop controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Drill rig inspected daily, deficiencies corrected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. All machine guards are in place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Platforms are properly constructed and accessible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment Travel and Set-up				
22. Safe clearance from overhead electrical maintained.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Mast lowered and equipment secure during travel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Drill rig level and stabilized, proper cribbing used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Mast secured before drilling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment Operation				
26. Personnel remain clear of cables and ropes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Drilling operations suspended in inclement weather.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. All gearboxes in neutral before starting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Drill rig is always operated from control panel. Operator never leaves control panel while drill is in operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Pressurized lines are equipped with safety cables.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Drilling discharges channeled away from work area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Compressed-air exhaust is controlled.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Wire ropes are inspected before use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Hoist and hardware used only for designed purpose.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. No more than one foot of drill column hoisted above mast.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Chuck jaws are not used as drill rod brake.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Wire ropes are properly matched to sleeves and are protected from sharp edges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Operators are not guiding wire ropes with hands.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Auger guides are used to start auger in hard surfaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



ATTACHMENT B

Self-Assessment Checklist – Drilling Operations

	Yes	No	N/A	N/O
40. Operator and tool handler have established responsibilities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Augers are attached to power coupling per Manufacturer's instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Auger flights are connected only by pins designed for such use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Workers remain clear of auger and other rotating parts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Cathead inspected before use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Clean dry rope is used on cathead.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Proper actions are followed for cathead operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Drill rods are not leaned unsecured against mast.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Prior to disconnection plugged core drill rods, pressure source is isolated and pressure is bled off.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drill Rig Maintenance				
49. Defects identified during inspection or operation are corrected before continuing operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Fall protection is used while climbing mast and for other unprotected elevated work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Augers are cleaned only when drill is in neutral and auger has stopped.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



APPENDIX C

MATERIAL SAFETY DATA SHEETS (MSDS)

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00901

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Alconox Detergent
Catalog Number: 2088000

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00901
Chemical Name: Not applicable
CAS No.: Not applicable
Chemical Formula: Not applicable
Chemical Family: Surfactants
Hazard: No effects anticipated.
Date of MSDS Preparation:
Day: 11
Month: December
Year: 2001

2. COMPOSITION / INFORMATION ON INGREDIENTS

Alkyl aryl sulphonates, lauryl alcohol sulfates, phosphates and carbonates

CAS No.: Not applicable
TSCA CAS Number: Not applicable
Percent Range: 100.0
Percent Range Units: weight / weight
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: No effects anticipated.

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: White powder
Odor: None

HMIS:
Health: 0
Flammability: 0
Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 0

Flammability: 0

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: No effects are anticipated

Skin Contact: No effects are anticipated

Skin Absorption: No effects anticipated

Target Organs: Not applicable

Ingestion: None reported

Target Organs: None reported

Inhalation: No effects anticipated

Target Organs: Not applicable

Medical Conditions Aggravated: None reported

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Flush eyes with water.

Skin Contact (First Aid): Wash skin with plenty of water.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: None required.

5. FIRE FIGHTING MEASURES

Flammable Properties: Material will not burn.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not determined

Hazardous Combustion Products: None reported

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Sweep up material. Place material in a plastic bag. Mark bag 'Non-hazardous trash', and dispose of as normal refuse. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep container tightly closed when not in use.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: Not applicable

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes Wash thoroughly after handling.

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White powder

Physical State: Solid

Molecular Weight: Not applicable

Odor: None

pH: Not determined

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Boiling Point: Not applicable

Melting Point: Not determined

Specific Gravity (water = 1): Not determined

Evaporation Rate (water = 1): Not applicable

Volatile Organic Compounds Content: Not applicable

Partition Coefficient (n-octanol / water): Not applicable

Solubility:

Water: Soluble

Acid: Not determined

Other: Not determined

Metal Corrosivity:

Steel: Not determined

Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Excess moisture

Reactivity / Incompatibility: None reported

Hazardous Decomposition: Heating to decomposition releases toxic fumes of carbon monoxide and carbon dioxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: None reported

Reproductive Effects Data: None reported

Ingredient Toxicological Data: --

No toxicological data available for the ingredients of this product.

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None

Special Instructions (Disposal): Place material in a plastic bag. Mark bag 'Non-hazardous trash', and dispose of as normal refuse.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Proper Shipping Name: Chemical Kit

Hazard Class: 9 UN Number 3316.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product does not meet the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): This product is not hazardous under 29 CFR.1910.1200 and therefore is not covered by Title III under SARA.

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Surfactant

References: Vendor Information. Technical Judgment.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE.
HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF
THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

HACH COMPANY ©2007

GFS CHEMICALS, INC.
P.O. Box 245 Powell, OH 43065
740-881-5501(Tel.) 740-881-5989(Fax)
1-800-424-9300(Chemtrec 24Hr. Info.)

MATERIAL SAFETY DATA SHEET

2174

CONDUCTIVITY STANDARD SOLUTION

CHEMICAL NAME & SYNONYMS

Conductivity Standard Solution
Potassium Chloride, Solution

DOT CLASS

NR

SARA TITLE 313

No

TSCA listed - Yes

FORMULA

KCl <5% - Not a hazardous material.
H₂O >95%

REPORTABLE QUANTITY

N/A
N/A

F.W.

74.55
18.02

CAS#

7447-40-7
7732-18-5

PHYSICAL DATA

Boiling point 100°C; Density 1.0; Conductivity @25°C 1,413 uS/cm (uMHO). Completely miscible with water.

APPEARANCE & ODOR

Clear, colorless solution. Odorless.

REACTIVITY & CONDITIONS TO AVOID

None.

FIRE HAZARDS

None.

EXTINGUISHER

Fight surrounding fire.

FLASHPOINT

N/A

LEL

N/A

UEL

N/A

HEALTH HAZARDS

Toxicity of this solution is very low (this is a very weak salt solution). Any salt solution may be irritating to eyes and mucous membranes. LD/TD: not found. OSHA PEL/ACGIH TLV not established. Not considered to be a carcinogen.

SPECIAL PRECAUTIONS

Always use good laboratory practices.

FIRST AID

Wash with water. If irritation develops, get medical attention.

SPILLS & LEAKS

Wash up with water. Disposal to sanitary drain.

CATALOG #

2174

PREPARED BY

MDM

DATE

April 1, 2004

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00024

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Ferrous Iron Reagent

Catalog Number: 2514025

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00024

Chemical Name: Not applicable

CAS No.: Not applicable

Chemical Formula: Not applicable

Chemical Family: Not applicable

Hazard: May cause irritation.

Date of MSDS Preparation:

Day: 05

Month: October

Year: 2007

2. COMPOSITION / INFORMATION ON INGREDIENTS

1, 10-Phenanthroline

CAS No.: 5144-89-8

TSCA CAS Number: 66-71-7

Percent Range: 1.0 - 10.0

Percent Range Units: weight / weight

LD50: Oral Rat LD₅₀ = 132 mg/kg

LC50: None reported

TLV: Not established

PEL: Not established

Hazard: May cause irritation.

Sodium Bicarbonate

CAS No.: 144-55-8

TSCA CAS Number: 144-55-8

Percent Range: 90.0 - 100.0

Percent Range Units: weight / weight

LD50: Oral rat LD₅₀ = 4220 mg/kg

LC50: None reported

TLV: Not established

PEL: Not established

Hazard: May cause irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White powder

Odor: Not determined

MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:

Health: 1

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 1

Flammability: 0

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: May cause irritation

Skin Contact: May cause irritation

Skin Absorption: None reported

Target Organs: None reported

Ingestion: Very large doses may cause: abdominal pain gastrointestinal disturbances alkalosis which causes abnormally high alkali reserve of the blood and other body fluids hypotension

Target Organs: None reported

Inhalation: May cause: respiratory tract irritation

Target Organs: None reported

Medical Conditions Aggravated: Pre-existing: Kidney conditions

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with soap and plenty of water. Call physician if irritation develops.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: Does not burn, but may melt in a fire, releasing toxic fumes.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: Toxic fumes of: sodium monoxide nitrogen oxides. carbon monoxide, carbon dioxide.

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Water. Carbon dioxide Dry chemical.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Flush the spilled material to the drain with a large excess of water. Decontaminate the area of the spill with a weak acid solution.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Keep container tightly closed when not in use. Protect from: moisture oxidizers

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin Do not breathe: dust Wash thoroughly after handling. Keep away from: oxidizers

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White powder

Physical State: Solid

Molecular Weight: Not applicable

Odor: Not determined

pH: Not determined

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Boiling Point: Not applicable
Melting Point: Not determined
Specific Gravity (water = 1): 2.10
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol / water): Not applicable
Solubility:
 Water: Slightly soluble
 Acid: Slightly soluble
 Other: Not determined
Metal Corrosivity:
 Steel: Not determined
 Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Excess moisture Heating to decomposition.
Reactivity / Incompatibility: Incompatible with: oxidizers
Hazardous Decomposition: Toxic fumes of: nitrogen oxides sodium oxides carbon monoxide carbon dioxide
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None reported
 LC50: None reported
 Dermal Toxicity Data: None reported
 Skin and Eye Irritation Data: Sodium Bicarbonate: Eye - rabbit - 100 mg/30 seconds - MILD; Skin - Human - 30 mg/3 days intermittent - MILD
 Mutation Data: None reported
 Reproductive Effects Data: None reported
Ingredient Toxicological Data: Sodium Bicarbonate: Oral rat LD₅₀ = 4220 mg/kg; 1, 10-Phenanthroline: Oral rat LD₅₀ = 132 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None
Special Instructions (Disposal): Dilute material with excess water making a weaker than 5% solution. Open cold water tap completely, slowly pour the material to the drain.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.
NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316. Proper Shipping Name: Chemical Kit
ALSO NOTE: If the National Competent Authority declares this product an environmental hazard by Special Provision 909 (IMDG) and Special Provision A97 (IATA) the classification may be UN3077 or UN3082.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

California Perchlorate Rule CCR Title 22 Chap 33:

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Iron determination

References: TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). In-house information. Technical Judgment. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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Page 1 of 4
Procter & Gamble
Fabric and Home Care Division
Ivorydale Technical Center
5299 Spring Grove Avenue
Cincinnati, OH 45217-1087

MATERIAL SAFETY DATA SHEET

MSDS #: LDL 0001
Supersedes: LDL9901

Issue Date: 09/28/00
Issue Date: 02/17/99

SECTION I - CHEMICAL PRODUCT

Identity: **Liquid Hand Dishwashing Detergents**

Brands:

DAWN (All Variations)

IVORY (All Variations)

JOY (All Variations)

Hazard Rating:

Health:	2	4=EXTREME
Flammability:	1	3=HIGH
Reactivity:	0	2= MODERATE
		1=SLIGHT

Emergency Telephone Number: 24hr P&G Operator:

DAWN - 1-800-725-3296 (DAWN)

IVORY 1-800-253-2753 (IVORY)

JOY - 1-800-436-1569 (JOY)

or call Local Poison Control Center or your physician

SECTION II - COMPOSITION AND INGREDIENTS

Ingredients/Chemical Name: Cleaning and sudsing agents (anionic and nonionic surfactants), dispensing aid (ethyl alcohol), water, stabilizing agents, colorant and perfume.

Dawn and Joy Antibacterial Hand Soaps also contain the antibacterial active Triclosan.

Dawn Hand Care product contains a protease enzyme.

Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200.

<u>Chemical Name</u>	<u>Common Name</u>	<u>CAS No.</u>	<u>Recommended Limits</u>	<u>Composition Range</u>	<u>LD50/LC50</u>
Ethyl alcohol	Ethanol	64-17-5	ACGIH TLV: 1880 mg/m ³	5-10%	N/A
Subtilisin	Protease	9014-01-1	NIOSH STEL 0.00006 mg/m ³	<0.01%	N/A

SECTION III - HAZARDS IDENTIFICATION**Health Hazards (Acute and Chronic):**

- Ingestions: Ingestion may cause transient gastrointestinal irritation.
 Eye Contact: May cause mild, transient irritation.
 Skin: Transient irritation with prolonged exposure to concentrated material.

Signs and Symptoms of Exposure:

- Ingestion: May result in nausea, vomiting, and/or diarrhea.
 Eye Contact: May cause stinging, tearing, itching, swelling, and/or redness.
 Skin: Prolonged contact with concentrated material may be drying or transiently irritating to skin.

SECTION IV - FIRST AID INFORMATION**Emergency and First Aid Procedures:**

- Ingestion: Drink 1 or 2 glasses of water.
 Eye Contact: Flush thoroughly with water for 15 minutes.
 Skin: If prolonged contact occurs, rinse thoroughly with water. If spilled on clothing, change clothes. If symptoms persist or recur, seek medical attention.

Other: Consumer product package has a voluntary avoid accidents statement.

SECTION V - FIRE FIGHTING INFORMATION

Flash Point (Method Used): 105-130°F. Pensky-Martens (Closed cup) **Explosive Limits:** *LEL:* N/A *UEL:* N/A

Extinguishing Media: CO₂, water or dry chemical.

Special Fire Fighting Procedures: None. Although this product has a flash point below 200°F (closed cup), it is an aqueous solution containing ethyl alcohol which does not sustain combustion.

Unusual Fire Hazards: None

Stability *Unstable:* *Conditions to Avoid:* None known
 Stable: X

Incompatibility (Materials to Avoid): None known

Hazardous Decomposition/By Products: None known

Hazardous Polymerization: *May Occur:* *Conditions to Avoid:* None known
 Will Not Occur: X

SECTION VI - ACCIDENTAL RELEASE MEASURES

Personal Precautions: None

Environmental Precautions: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. **Ultra Dawn, Ultra Joy and Ultra Ivory undiluted waste products are considered RCRA Ignitable.**

Solutions of the Ultra Dawn, Ultra Ivory or Ultra Joy liquid hand dishwashing detergents, diluted in the course of use, may be allowed to be flushed down sewer. First check with your local water treatment plant. Recycling is recommended for undiluted scrap product. Do not landfill.

Steps To Be Taken in Case Material is Released or Spilled: Prevent spills from reaching a waterway. Sorbents may be used. Read "Waste Disposal Method" below for further information.

SECTION VII - HANDLING AND STORAGE**Precautions To Be Taken in Handling and Storing:** No unusual precautions necessary.**Other Precautions:** None known**SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION****Respiratory Protection (Specify Type):** None required with normal use.**Ventilation** *Local Exhaust:* None required with normal consumer use.*Special:* None*Mechanical (General):* Normal/general dilution ventilation is acceptable. *Other:* None**Eye Protection:** None required with normal consumer use.*Industrial Setting:* For splash protection, use chemical goggles. Eye Wash fountain is desirable.**Protective Gloves:** None required with normal use.*Industrial Setting:* Protective gloves (rubber, neoprene) should be used for prolonged direct contact.**Other Protective Equipment:** None required with normal use.**SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES****Boiling Point °F:** Not known**Specific Gravity (H₂O=1):** ca. 1**Vapor Pressure (mm Hg):** N/A**Percent Volatile by Volume (%):** ~60-65%**Vapor Density (Air=1):** N/A**Evaporation Rate (nBuOAc=1):** Unknown**Odor Threshold:** N/A**Freezing Point:** ~ 30 F**Coefficient of Water/Oil Distribution:** N/A**pH (1% solution):** ~ 8**Scooped Density:** N/A**Solubility in Water:** Completely**Appearance and Odor:** Purple, Blue, Green, Yellow,
Pink or Orange liquids. All products are perfumed.**Reserve Alkalinity:** N/A**SECTION X - STABILITY AND REACTIVITY****Possible Hazardous Reactions/Conditions:** None known**Conditions to Avoid:** None**Materials to Avoid:** None**Hazardous Decomposition Products:** None known**Other Recommendations:** None**SECTION XI - TOXICOLOGICAL INFORMATION**

LD50 (rats oral): approx 12 mL/kg

ED50 approx 2.3 mL/kg

Liquid hand dishwashing detergents have a relatively low order of toxicity. They may be irritating, but they are not expected to be corrosive. They are expected to be emetic.

SECTION XII - ECOLOGICAL INFORMATION

All surfactants are readily biodegradable. These products are safe for septic tanks.

SECTION XIII - DISPOSAL CONSIDERATIONS

Waste Disposal Method: DISPOSAL IS TO BE PERFORMED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS. RCRA hazardous under the classification "Ignitable." RCRA provides an exemption for household waste. Household product is safe for disposal down the drain during use or in the trash. *Industrial Setting:* Solutions of diluted detergent in the course of use, may be allowed to be flushed down sewer. First check with your local water treatment plant. Recycling is recommended for undiluted scrap product.

Hazardous waste incineration is necessary for the Ultra versions of these products if disposal is ultimately warranted. Do not landfill.

SECTION XIV - TRANSPORT INFORMATION

Small household containers of Dawn, Joy and Ivory are not DOT regulated.

SECTION XV - ADDITIONAL REGULATORY INFORMATION

All components are listed on the US TSCA Inventory. No components are affected by Significant New Use Rules (SNURs) under TSCA §5.

No components of Dawn, Ivory or Joy are subject to California Proposition 65 labeling.

All ingredients are CEPA approved for import to Canada by Procter & Gamble only. This product has been classified with Hazard Criteria of the Canadian Control Products Regulation (CPR) and this MSDS contains all information required by the Canadian Products Regulation.

SECTION XVI - OTHER INFORMATION

*N/A. - Not Applicable

*N/K. - Not Known

The submission of this MSDS may be required by law, but this is not an assertion that the substance is hazardous when used in accordance with proper safety practices and normal handling procedures. Data supplied is for use only in connection with occupational safety and health.

The information contained herein has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company's knowledge. The information relates to the specific material designated herein, and does not relate to the use in combination with any other material or any other process. Procter & Gamble assumed no responsibility for injury to the recipient or third persons, for any damage to any property resulting from misuse of the controlled product.

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00222

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Nitric Acid

Catalog Number: 15249

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00222

Chemical Name: Nitric acid

CAS No.: 7697-37-2

Chemical Formula: HNO₃

Chemical Family: Inorganic Acid

Hazard: Causes severe burns. Oxidizer.

Date of MSDS Preparation:

Day: 19

Month: March

Year: 2007

2. COMPOSITION / INFORMATION ON INGREDIENTS

Nitric Acid

CAS No.: 7697-37-2

TSCA CAS Number: 7697-37-2

Percent Range: 65.0 - 75.0

Percent Range Units: weight / weight

LD50: Oral human LDLo = 430 mg/kg.

LC50: Inhalation rat LC₅₀ = 625 ppm/4hours.

TLV: 2 ppm

PEL: 2 ppm

Hazard: Causes severe burns. Oxidizer.

Demineralized Water

CAS No.: 7732-18-5

TSCA CAS Number: 7732-18-5

Percent Range: 25.0 - 35.0

Percent Range Units: weight / weight

LD50: None reported

LC50: None reported

TLV: Not established

PEL: Not established

Hazard: No effects anticipated.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Faint yellow to colorless

Odor: Suffocating

MAY BE FATAL IF SWALLOWED OR INHALED CAUSES SEVERE BURNS

STRONG OXIDIZER: CONTACT WITH OTHER MATERIAL MAY BE EXPLOSIVE

HMIS:

Health: 3

Flammability: 1

Reactivity: 1

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 3

Flammability: 0

Reactivity: 0

Symbol: oxy

Potential Health Effects:

Eye Contact: Causes severe burns

Skin Contact: Causes severe burns

Skin Absorption: None reported

Target Organs: None reported

Ingestion: Causes: severe burns

Target Organs: None reported

Inhalation: Causes: severe burns May cause: bronchitis pneumonitis teeth erosion

Target Organs: None reported

Medical Conditions Aggravated: Pre-existing: Eye conditions Respiratory conditions Skin conditions

Chronic Effects: Chronic overexposure may cause erosion of the teeth

Cancer / Reproductive Toxicity Information:

O.S.H.A. Listed: No

IARC Listed: No

NTP Listed: No

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Never give anything by mouth to an unconscious person. Call physician immediately.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: Not Flammable, but reacts with most metals to form flammable hydrogen gas. Strong oxidizer. Contact with combustible materials may cause a fire or explosion.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable
Autoignition Temperature: Not applicable
Hazardous Combustion Products: Toxic fumes of: nitrogen oxides.
Fire / Explosion Hazards: Contact with metals gives off hydrogen gas which is flammable May react violently with: combustible materials
Static Discharge: None reported.
Mechanical Impact: None reported
Extinguishing Media: Use media appropriate to surrounding fire conditions Water spray to cool containers
Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Remove all combustible material from spill area. Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment. Dike large spills to keep spilled material from entering sewage and drainage systems or bodies of water.

Clean-up Technique: Cover spilled material with an alkali, such as soda ash or sodium bicarbonate. Scoop up slurry into a large beaker. Dilute with a large excess of water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Product is regulated as RCRA hazardous waste. Product is regulated as a hazardous water pollutant.

304 EHS RQ (40 CFR 355): Nitric Acid 1000 lbs.

D.O.T. Emergency Response Guide Number: 157

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin clothing Do not breathe mist or vapors. Use with adequate ventilation. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Store in a cool, dry place. Keep away from: combustible materials heat metals organic material

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: neoprene latex gloves

Inhalation Protection: laboratory fume hood

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: mist/vapor Keep away from: alkalies metals organic materials other combustible materials oxidizable materials Wash thoroughly after handling.

TLV: 2 ppm

PEL: 2 ppm

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Faint yellow to colorless
Physical State: Liquid
Molecular Weight: 63.006
Odor: Suffocating
pH: <0.5
Vapor Pressure: 62 mm Hg @ 20°C
Vapor Density (air = 1): 2 - 3
Boiling Point: 122°C (251.6°F)
Melting Point: -34°C (-29.2°F)
Specific Gravity (water = 1): 1.41
Evaporation Rate (water = 1): Not determined
Volatile Organic Compounds Content: None
Partition Coefficient (n-octanol / water): Not applicable
Solubility:
 Water: Miscible
 Acid: Miscible
 Other: Not determined
Metal Corrosivity:
 Steel: Corrosive
 Aluminum: Corrosive

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Excess moisture
Reactivity / Incompatibility: May react violently in contact with: acids alkalies carbides hydrogen sulfide metals turpentine May explode in contact with: combustible materials
Hazardous Decomposition: Toxic fumes of: nitrogen oxides
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: Oral human LDLo = 430 mg/kg.
 LC50: Inhalation rat LC₅₀ = 625 ppm/4hours.
 Dermal Toxicity Data: None reported.
 Skin and Eye Irritation Data: None reported.
 Mutation Data: None reported.
 Reproductive Effects Data: Oral rat TDLo = 2345 mg/kg; biochemical and metabolic effects on newborn.
Ingredient Toxicological Data: Not applicable

12. ECOLOGICAL INFORMATION

Product Ecological Information: Shore crab LC50 = 180 mg/l/48H; Cockle LC50 = 330 - 1000 mg/l/48H; Starfish LC50 = 100-300 mg/l/48H
Ingredient Ecological Information: --
Not applicable

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: D002

Special Instructions (Disposal): Work in an approved fume hood. Working in a large container, cautiously add small portions of the material to cold water with agitation. Do not breathe the fumes. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Nitric Acid
(70%)

DOT Hazard Class: 8

DOT Subsidiary Risk: NA

DOT ID Number: UN2031

DOT Packing Group: II

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Nitric Acid
(70%)

ICAO Hazard Class: 8

ICAO Subsidiary Risk: NA

ICAO ID Number: UN2031

ICAO Packing Group: II

I.M.O.:

I.M.O. Proper Shipping Name: Nitric Acid
(70%)

I.M.O. Hazard Class: 8

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: UN2031

I.M.O. Packing Group: II

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard Fire Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product contains a chemical(s) subject to the reporting requirements of Section 313 of Title III of SARA.

Nitric Acid

302 (EHS) TPQ (40 CFR 355): Nitric acid: 1000 lbs.

304 CERCLA RQ (40 CFR 302.4): Nitric acid: 1000 lbs.

304 EHS RQ (40 CFR 355): Nitric Acid 1000 lbs.

Clean Water Act (40 CFR 116.4): Nitric acid - RQ 1000 lbs.

RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.

C.P.S.C.: The label for this product bears the signal word "POISON" because the concentration of Nitric Acid in the product is greater than/equal to 5%.

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

California Perchlorate Rule CCR Title 22 Chap 33:

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: TSCA Listed: Yes

TSCA CAS Number: 7697-37-2

16. OTHER INFORMATION

Intended Use: Laboratory reagent

References: Vendor Information. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. NIOSH Registry of Toxic Effects of Chemical Substances, 1985-86. Cincinnati: U.S. Department of Health and Human Services, April, 1987. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor).

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00055

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: NitriVer ® 3 Nitrite Reagent

Catalog Number: 2107169

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00055

Chemical Name: Not applicable

CAS No.: Not applicable

Chemical Formula: Not applicable

Chemical Family: Not applicable

Hazard: Causes eye burns.

Date of MSDS Preparation:

Day: 24

Month: March

Year: 2007

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chromatropic Acid, Disodium salt

CAS No.: 129-96-4

TSCA CAS Number: 129-96-4

Percent Range: 1.0 - 5.0

Percent Range Units: weight / weight

LD50: Oral rat LD50 > 5000 mg/kg

LC50: None reported

TLV: Not established

PEL: Not established

Hazard: May cause irritation.

Sodium Sulfanilate

CAS No.: 515-74-2

TSCA CAS Number: 515-74-2

Percent Range: 5.0 - 15.0

Percent Range Units: weight / weight

LD50: None reported

LC50: None reported

TLV: Not established

PEL: Not established

Hazard: Toxic properties unknown. May cause irritation.

Potassium Pyrosulfate

CAS No.: 7790-62-7

TSCA CAS Number: 7790-62-7

Percent Range: 1.0 - 10.0
Percent Range Units: weight / weight
LD50: Oral rat LD50 = 2340 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: Causes eye burns.

Potassium Phosphate, Monobasic

CAS No.: 7778-77-0
TSCA CAS Number: 7778-77-0
Percent Range: 75.0 - 85.0
Percent Range Units: weight / weight
LD50: Oral rat LD50 = 7100 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: May cause irritation.

1,2-Cyclohexanediaminetetraacetic Acid Trisodium Salt

CAS No.: 36679-96-6
TSCA CAS Number: 36679-96-6
Percent Range: 1.0 - 5.0
Percent Range Units: weight / weight
LD50: None reported
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: Toxic properties unknown. May cause irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White powder

Odor: Not determined

CAUSES EYE BURNS MAY CAUSE SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:

Health: 3

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 2

Flammability: 0

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: Causes eye burns.

Skin Contact: May cause irritation

Skin Absorption: None reported

Target Organs: None reported

Ingestion: May cause: irritation of the mouth and esophagus Very large doses may cause: gastrointestinal disturbances cardiac depression kidney damage

Target Organs: Heart Kidneys

Inhalation: May cause: irritation of nose and throat

Target Organs: None reported

Medical Conditions Aggravated: Pre-existing: Eye conditions Kidney conditions Central nervous system diseases

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with soap and plenty of water. Call physician if irritation develops.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, this product decomposes to form toxic gases.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: Toxic fumes of: phosphorus oxides carbon monoxide, carbon dioxide.

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Scoop up spilled material into a large beaker and dissolve with water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush the spilled material to the drain with a large excess of water.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled.

Special Instructions (for accidental release): Not applicable
304 EHS RQ (40 CFR 355): Not applicable
D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Protect from: light heat moisture

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes skin Do not breathe: dust Wash thoroughly after handling. Protect from: light heat moisture

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White powder

Physical State: Solid

Molecular Weight: Not applicable

Odor: Not determined

pH: of 5% solution = 3.2

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Boiling Point: Not applicable

Melting Point: 224°C (435°F)

Specific Gravity (water = 1): 3.12

Evaporation Rate (water = 1): Not applicable

Volatile Organic Compounds Content: Not applicable

Partition Coefficient (n-octanol / water): Not applicable

Solubility:

Water: Soluble

Acid: Not determined

Other: Not determined

Metal Corrosivity:

Steel: 0.057 in/yr

Aluminum: 0.00 in/yr

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Conditions to Avoid: Excess moisture Extreme temperatures

Reactivity / Incompatibility: None reported

Hazardous Decomposition: Toxic fumes of: phosphorus oxides carbon dioxide carbon monoxide

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:

LD50: None reported

LC50: None reported

Dermal Toxicity Data: None reported

Skin and Eye Irritation Data: None reported

Mutation Data: None reported

Reproductive Effects Data: None reported

Ingredient Toxicological Data: Chromatropic Acid: Oral rat LD50: >5000 mg/kg, Potassium Phosphate

Monobasic: Oral rat LD50 = 7100 mg/kg, Potassium Pyrosulfate: Oral rat LD50 = 2340 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product.

Ingredient Ecological Information: --

No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None

Special Instructions (Disposal): Dilute material with excess water making a weaker than 5% solution. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Proper Shipping Name: Chemical Kit

Hazard Class: 9 UN Number 3316.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

California Perchlorate Rule CCR Title 22 Chap 33:

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: This product contains a chemical(s) exempt from the TSCA 8(b) Inventory due to a Low Volume Exemption held by Hach Company.

TSCA CAS Number: Not applicable

1,2-Cyclohexanediaminetetraacetic Acid Trisodium Salt. This chemical may only be used as a chelating reagent for chemical reactions.

16. OTHER INFORMATION

Intended Use: Determination of nitrite

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. In-house information. Technical Judgment. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE.
HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF
THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

HACH COMPANY ©2008

Material Safety Data Sheet



Nitrogen

Section 1. Chemical product and company identification

Product name	: Nitrogen
Supplier	: AIRGAS INC., on behalf of its subsidiaries 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Product use	: Synthetic/Analytical chemistry. Liquid – cryogenic coolant.
Synonym	: nitrogen (dot); nitrogen gas; Nitrogen NF, LIN, Cryogenic Liquid Nitrogen, Liquid Nitrogen
MSDS #	: 001040
Date of Preparation/Revision	: 2/13/2009.
In case of emergency	: 1-866-734-3438

Section 2. Hazards identification

Physical state	: Gas. [NORMALLY A COLORLESS GAS: MAY BE A CLEAR COLORLESS LIQUID AT LOW TEMPERATURES. SOLD AS A COMPRESSED GAS OR LIQUID IN STEEL CYLINDERS.]
Emergency overview	: WARNING! GAS: CONTENTS UNDER PRESURE. Do not puncture or incinerate container. Can cause rapid suffocation. May cause severe frostbite. LIQUID: Extremely cold liquid and gas under pressure. Can cause rapid suffocation. May cause severe frostbite. Do not puncture or incinerate container. Contact with rapidly expanding gases or liquids can cause frostbite.
Routes of entry	: Inhalation
Potential acute health effects	
Eyes	: Contact with rapidly expanding gas may cause burns or frostbite. Contact with cryogenic liquid can cause frostbite and cryogenic burns.
Skin	: Contact with rapidly expanding gas may cause burns or frostbite. Contact with cryogenic liquid can cause frostbite and cryogenic burns.
Inhalation	: Acts as a simple asphyxiant.
Ingestion	: Ingestion is not a normal route of exposure for gases. Contact with cryogenic liquid can cause frostbite and cryogenic burns.
Potential chronic health effects	: CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.
Medical conditions aggravated by over-exposure	: Acute or chronic respiratory conditions may be aggravated by overexposure to this gas.
See toxicological information (section 11)	

Section 3. Composition, Information on Ingredients

Name	CAS number	% Volume	Exposure limits
Nitrogen	7727-37-9	100	Oxygen Depletion [Asphyxiant]

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Section 5. Fire-fighting measures

- Flammability of the product** : Non-flammable.
- Products of combustion** : Decomposition products may include the following materials:
nitrogen oxides
- Fire-fighting media and instructions** : Use an extinguishing agent suitable for the surrounding fire.
- Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.
- Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : Immediately contact emergency personnel. Stop leak if without risk. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : High pressure gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cryogenic liquids. Prevent entrapment of liquid in closed systems or piping without pressure relief devices. Some materials may become brittle at low temperatures and will easily fracture.

Nitrogen

- Storage** : Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).
For additional information concerning storage and handling refer to Compressed Gas Association pamphlets P-1 Safe Handling of Compressed Gases in Containers and P-12 Safe Handling of Cryogenic Liquids available from the Compressed Gas Association, Inc.

Section 8. Exposure controls/personal protection

- Engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protection

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

When working with cryogenic liquids, wear a full face shield.

- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93

- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Insulated gloves suitable for low temperatures

- Personal protection in case of a large spill** : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.

Product name

nitrogen

Oxygen Depletion [Asphyxiant]

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

- Molecular weight** : 28.02 g/mole
Molecular formula : N₂
Boiling/condensation point : -195.8°C (-320.4°F)
Melting/freezing point : -210°C (-346°F)
Critical temperature : -146.9°C (-232.4°F)
Vapor density : 0.967 (Air = 1) Liquid Density@BP: 50.46 lb/ft³ (808.3 kg/m³)
Specific Volume (ft³/lb) : 13.8889
Gas Density (lb/ft³) : 0.072

Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Toxicity data

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material to humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

Not available.

Environmental fate : Not available.



Environmental hazards : No known significant effects or critical hazards.


Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1066	NITROGEN, COMPRESSED	2.2	Not applicable (gas).		Limited quantity Yes.
	UN1977	Nitrogen, refrigerated liquid				Packaging instruction Passenger aircraft Quantity limitation: 75 kg Cargo aircraft Quantity limitation: 150 kg
TDG Classification	UN1066	NITROGEN, COMPRESSED	2.2	Not applicable (gas).		Explosive Limit and Limited Quantity Index 0.125
	UN1977	Nitrogen, refrigerated liquid				Passenger Carrying Road or Rail Index 75

Nitrogen						
Mexico Classification	UN1066	NITROGEN, COMPRESSED	2.2	Not applicable (gas).		-
	UN1977	Nitrogen, refrigerated liquid				

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Section 15. Regulatory information

United States

- U.S. Federal regulations

: United States inventory (TSCA 8b): This material is listed or exempted.
 SARA 302/304/311/312 extremely hazardous substances: No products were found.
 SARA 302/304 emergency planning and notification: No products were found.
 SARA 302/304/311/312 hazardous chemicals: nitrogen
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification: nitrogen: Sudden release of pressure
 Clean Water Act (CWA) 307: No products were found.
 Clean Water Act (CWA) 311: No products were found.
 Clean Air Act (CAA) 112 accidental release prevention: No products were found.
 Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
 Clean Air Act (CAA) 112 regulated toxic substances: No products were found.
- State regulations

: Connecticut Carcinogen Reporting: This material is not listed.
 Connecticut Hazardous Material Survey: This material is not listed.
 Florida substances: This material is not listed.
 Illinois Chemical Safety Act: This material is not listed.
 Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
 Louisiana Reporting: This material is not listed.
 Louisiana Spill: This material is not listed.
 Massachusetts Spill: This material is not listed.
 Massachusetts Substances: This material is listed.
 Michigan Critical Material: This material is not listed.
 Minnesota Hazardous Substances: This material is not listed.
 New Jersey Hazardous Substances: This material is listed.
 New Jersey Spill: This material is not listed.
 New Jersey Toxic Catastrophe Prevention Act: This material is not listed.
 New York Acutely Hazardous Substances: This material is not listed.
 New York Toxic Chemical Release Reporting: This material is not listed.
 Pennsylvania RTK Hazardous Substances: This material is listed.
 Rhode Island Hazardous Substances: This material is not listed.

Canada

- WHMIS (Canada)

: Class A: Compressed gas.
 CEPA Toxic substances: This material is not listed.
 Canadian ARET: This material is not listed.
 Canadian NPRI: This material is not listed.
 Alberta Designated Substances: This material is not listed.
 Ontario Designated Substances: This material is not listed.
 Quebec Designated Substances: This material is not listed.

Section 16. Other information

United States

Nitrogen

Label requirements : GAS:
CONTENTS UNDER PRESURE.
Do not puncture or incinerate container.
Can cause rapid suffocation.
May cause severe frostbite.
LIQUID:
Extremely cold liquid and gas under pressure.
Can cause rapid suffocation.
May cause severe frostbite.

Canada

Label requirements : Class A: Compressed gas.

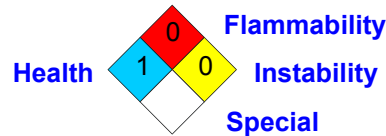
Hazardous Material Information System (U.S.A.)

Health	1
Flammability	0
Physical hazards	0

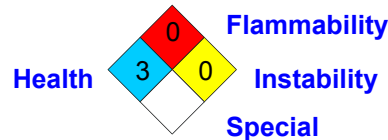
liquid:

Health	3
Fire hazard	0
Reactivity	0
Personal protection	

National Fire Protection Association (U.S.A.)



liquid:



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Material Safety Data Sheet

June 1, 1999

YSI Incorporated
1725 Brannum Lane
Yellow Springs, OH 45387
USA

C-P# 05478-60

Information and Emergency Phone: (937) 767-7241

Page 1 of 2

SECTION 1 - MATERIAL IDENTIFICATION

PRODUCT NAME: **YSI 3682 Zobell Solution** (ORP Cal. Solution)

FORMULA: n/ap

Chemical Type: Inorganic chloride / cyanide

CAS No. n/app

SECTION 2 - HAZARDOUS / IMPORTANT INGREDIENTS

<u>Chemical</u>	<u>CAS No.</u>	<u>PERCENT</u>	<u>PEL/TLV</u>	<u>CARCINOGEN</u> (OSHA, NTP, IARC)
Potassium chloride	7447-40-7	72 - 78%	none	no
Potassium ferrocyanide, trihydrate	14459-95-1	10 - 15%	none	no
Potassium ferricyanide	13746-66-2	10 - 15%	none	no

SECTION 3 - CHEMICAL AND PHYSICAL PROPERTIES

Appearance: white powder

Odor: none

pH: neutral

Water Solubility: infinite

Evaporation Rate: n/av

Boiling Point: n/av

Melting Point: n/av

Specific Gravity: n/av

Vapor Pressure: n/ap

Vapor Density: n/ap

SECTION 4 - FIRE AND EXPLOSION HAZARDS

Flash Point: none

Explosive Limits: none

Extinguishing Media: n/ap

Special Firefighting Procedures and Hazards: Material is not combustible. May emit toxic fumes when heated, such as NO_x, HCN, HCl. Wear protection as described in Section 6.

SECTION 5 - REACTIVITY INFORMATION

Stable: X Unstable: _____ Precautions: none known

Hazardous Polymerization: Occurs: _____ Does Not Occur: X

Incompatibility: strong acids and oxidizing agents.

Hazardous Decomposition Products: When heated, possibly NO_x, HCN, HCl.

SECTION 6 - HEALTH HAZARDS / PROTECTIVE MEASURES / FIRST AIDInhalation:

Possible irritation from dusts. (see CHRONIC below)
Use a NIOSH approved respirator for dusts. Get supplier recommendations. Provide adequate ventilation.
Minimize dusty conditions.
Remove to fresh air and provide artificial respiration if needed.

Skin:

Possible irritation from dusts. (see CHRONIC below)
Wear dust-proof gloves and other body protection as needed. Minimize dusty conditions.
Wash exposed areas with soap and water for 15 minutes. Remove contaminated clothing, and wash before re-using.

Eyes:

Possible irritation from dust.
Wear dust barrier goggles. Eliminate dusty conditions.
Flush with water for 15 minutes.

Ingestion

No effects expected from normal use and minor amounts ingested. Large amounts, over 1 tablespoon, can cause digestive system upset s. (see CHRONIC below)
Reduce dusting. Avoid mouth breathing. Use facemask. Provide adequate ventilation.
Avoid swallowing. Spit out. Drink large amounts of water. Induce vomiting if person is conscious. Otherwise, and if effects persist, get medical attention.

CHRONIC EFFECTS: None reported for this material. "Cyanides" in general are often reported as toxic to humans. Therefore, it is recommended that exposure via skin, inhalation, and ingestion be limited.

IN ALL CASES: GET MEDICAL ATTENTION IF EFFECTS PERSIST.

Most likely routes of entry: skin, eyes, ingestion.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

Spills and Leaks: Take up powder in any container and hold for disposal. Flush residual to sewer or ground. Provide personal protection as described in Section 6.

Storage and Handling: Keep containers closed. Discard any material that may be contaminated. Minimize dusting.

Waste Disposal: Is not listed as RCRA hazardous waste at this date. Cyanides are restricted in water disposed to streams and to sewers. Therefore, landfill disposal is indicated; check with local disposal companies.

Empty Containers: Rinse well. Dispose as appropriate for glass and plastic containers.

SECTION 8 - REGULATORY INFORMATION

DOT: Not regulated.
SARA Title III, S.313, Form R: Nothing reportable.

The information contained herein is based on data available at this time and is believed to be accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Since information contained herein may be applied under conditions beyond our control, and with which we may be unfamiliar, no responsibility is assumed for the results of its use. The person receiving this information shall make his own determination of the suitability of the material for his particular use.

A96008A

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00370

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Buffer Solution pH 10.01 \pm 0.02

Catalog Number: 2283649

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00370

Chemical Name: Not applicable

CAS No.: Not applicable

Chemical Formula: Not applicable

Chemical Family: Not applicable

Hazard: May cause irritation.

Date of MSDS Preparation:

Day: 27

Month: February

Year: 2008

2. COMPOSITION / INFORMATION ON INGREDIENTS

Demineralized Water

CAS No.: 7732-18-5

TSCA CAS Number: 7732-18-5

Percent Range: > 99.0

Percent Range Units: volume / volume

LD50: None reported

LC50: None reported

TLV: Not established

PEL: Not established

Hazard: No effects anticipated.

Other components, each

CAS No.: Not applicable

TSCA CAS Number: Not applicable

Percent Range: < 1.0

Percent Range Units: volume / volume

LD50: Not applicable

LC50: Not applicable

TLV: Not established

PEL: Not established

Hazard: Any ingredient(s) of this product listed as "Other component(s)" is not considered a health hazard to the user of this product.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Clear, blue

Odor: None

HMIS:

Health: 1

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 0

Flammability: 0

Reactivity: 0

Symbol: Not applicable

Potential Health Effects:

Eye Contact: May cause irritation

Skin Contact: May cause irritation

Skin Absorption: No effects anticipated

Target Organs: Not applicable

Ingestion: None reported

Target Organs: None reported

Inhalation: No effects anticipated

Target Organs: Not applicable

Medical Conditions Aggravated: None reported

Chronic Effects: None reported

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported

Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with plenty of water. Call physician if irritation develops.

Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: None required.

5. FIRE FIGHTING MEASURES

Flammable Properties: Material will not burn.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: None

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Cover spilled material with a dry acid, such as citric or boric. Scoop up slurry into a large beaker. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Flush reacted material to the drain with a large excess of water.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Protect from: heat Keep container tightly closed when not in use.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves lab coat

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes Wash thoroughly after handling.

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Clear, blue

Physical State: Liquid

Molecular Weight: Not applicable

Odor: None

pH: 10.0

Vapor Pressure: Not determined

Vapor Density (air = 1): Not determined

Boiling Point: ~100°C (~212°F)

Melting Point: ~0°C (~32°F)

Specific Gravity (water = 1): 0.990

Evaporation Rate (water = 1): 0.76
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol / water): Not determined
Solubility:
 Water: Soluble
 Acid: Soluble
 Other: Not determined
Metal Corrosivity:
 Steel: Not determined
 Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Heat Evaporation
Reactivity / Incompatibility: None reported
Hazardous Decomposition: None reported
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None reported
 LC50: None reported
 Dermal Toxicity Data: None reported
 Skin and Eye Irritation Data: None reported
 Mutation Data: None reported
 Reproductive Effects Data: None reported
Ingredient Toxicological Data: None reported

12. ECOLOGICAL INFORMATION

Product Ecological Information: No information available for this product.
Ingredient Ecological Information: None reported

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None
Special Instructions (Disposal): Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.
NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:
 D.O.T. Proper Shipping Name: Not Currently Regulated
 --

DOT Hazard Class: NA
DOT Subsidiary Risk: NA
DOT ID Number: NA
DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA
ICAO Subsidiary Risk: NA
ICAO ID Number: NA
ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA
I.M.O. Subsidiary Risk: NA
I.M.O. ID Number: NA
I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:
Hazard Class: 9 UN Number 3316. Proper Shipping Name: Chemical Kit

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable
304 CERCLA RQ (40 CFR 302.4): Not applicable
304 EHS RQ (40 CFR 355): Not applicable
Clean Water Act (40 CFR 116.4): Not applicable
RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): None

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Buffer

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Technical Judgment. In-house information.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

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HACH COMPANY ©2008

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00368

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Buffer Solution pH 4.01 \pm 0.02

Catalog Number: 2283449

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00368

Chemical Name: Not applicable

CAS No.: Not applicable

Chemical Formula: Not applicable

Chemical Family: Not applicable

Hazard: Practically non-toxic.

Date of MSDS Preparation:

Day: 09

Month: February

Year: 2008

2. COMPOSITION / INFORMATION ON INGREDIENTS

Demineralized Water

CAS No.: 7732-18-5

TSCA CAS Number: 7732-18-5

Percent Range: >95.0

Percent Range Units: weight / weight

LD50: None reported

LC50: None reported

TLV: Not established

PEL: Not established

Hazard: No effects anticipated.

Other components, each

CAS No.: Not applicable

TSCA CAS Number: Not applicable

Percent Range: < 1.0

Percent Range Units: volume / volume

LD50: Not applicable

LC50: Not applicable

TLV: Not established

PEL: Not established

Hazard: Any ingredient(s) of this product listed as "Other component(s)" is not considered a health hazard to the user of this product.

Potassium Acid Phthalate

CAS No.: 877-24-7

TSCA CAS Number: 877-24-7
Percent Range: 1.0 - 5.0
Percent Range Units: weight / volume
LD50: Oral rat LDLo = 3200 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: May cause irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: Clear, red liquid
Odor: None

HMIS:

Health: 0
Flammability: 0
Reactivity: 0
Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 0
Flammability: 0
Reactivity: 0
Symbol: Not applicable

Potential Health Effects:

Eye Contact: No effects are anticipated
Skin Contact: No effects are anticipated
Skin Absorption: No effects anticipated
Target Organs: Not applicable
Ingestion: No Effects Anticipated
Target Organs: Not applicable
Inhalation: No effects anticipated
Target Organs: Not applicable
Medical Conditions Aggravated: None reported
Chronic Effects: No effects anticipated
Cancer / Reproductive Toxicity Information:
This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: None reported
Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Flush eyes with water. Call physician if irritation develops.
Skin Contact (First Aid): Wash skin with soap and plenty of water.
Ingestion (First Aid): Give large quantities of water. Call physician immediately.

Inhalation: None required.

5. FIRE FIGHTING MEASURES

Flammable Properties: Material will not burn.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Hazardous Combustion Products: Not applicable

Fire / Explosion Hazards: None reported

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Use media appropriate to surrounding fire conditions

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Containment Technique: Stop spilled material from being released to the environment.

Clean-up Technique: Cover spilled material with an alkali, such as soda ash or sodium bicarbonate. Scoop up slurry into a large beaker. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.

Special Instructions (for accidental release): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes Wash thoroughly after handling.

Storage: Keep container tightly closed when not in use.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves

Inhalation Protection: adequate ventilation

Precautionary Measures: Avoid contact with: eyes Wash thoroughly after handling.

TLV: Not established

PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Clear, red liquid
Physical State: Liquid
Molecular Weight: Not applicable
Odor: None
pH: 4.01
Vapor Pressure: Not determined
Vapor Density (air = 1): Not determined
Boiling Point: > 100°C (> 212°F)
Melting Point: < 0°C (< 32°F)
Specific Gravity (water = 1): 1.002
Evaporation Rate (water = 1): Not determined
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol / water): Not determined
Solubility:
 Water: Soluble
 Acid: Soluble
 Other: Not determined
Metal Corrosivity:
 Steel: Not determined
 Aluminum: Not determined

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Extreme temperatures
Reactivity / Incompatibility: None reported
Hazardous Decomposition: None reported
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
 LD50: None reported
 LC50: None reported
 Dermal Toxicity Data: None reported
 Skin and Eye Irritation Data: None reported
 Mutation Data: None reported
 Reproductive Effects Data: None reported
Ingredient Toxicological Data: Potassium Acid Phthalate: Oral rat LD_{Lo} = 3200 mg/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product.
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None
Special Instructions (Disposal): Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Not Currently Regulated

--

DOT Hazard Class: NA

DOT Subsidiary Risk: NA

DOT ID Number: NA

DOT Packing Group: NA

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Not Currently Regulated

--

ICAO Hazard Class: NA

ICAO Subsidiary Risk: NA

ICAO ID Number: NA

ICAO Packing Group: NA

I.M.O.:

I.M.O. Proper Shipping Name: Not Currently Regulated

--

I.M.O. Hazard Class: NA

I.M.O. Subsidiary Risk: NA

I.M.O. ID Number: NA

I.M.O. Packing Group: NA

Additional Information: This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification:

Hazard Class: 9 UN Number 3316.

Proper Shipping Name: Chemical Kit

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product does not meet the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): This product is not hazardous under 29 CFR.1910.1200 and therefore is not covered by Title III under SARA.

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Not applicable

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): --

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Buffer

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Technical Judgment. In-house information. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991.

Revision Summary: Updates in Section(s) 14,

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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MATERIAL SAFETY DATA SHEET

I. Chemical Product and Company Identification

Product Name: Quick Cal Solution	Manufacturer: In-Situ Inc. 221 East Lincoln Avenue Fort Collins, Colorado 80524 Telephone: 970 498 1500 Fax: 970 498 1598	Emergency Contact: INFOTRAC Emergency Response Hotline: 1-800-535-5053 (in the U.S. and Canada) 1-352-323-3500 www.infotrac.net
Hazardous Shipping Label:	Dot None	IATA None

II. Ingredients

Hazardous Components Specific Chemical Identity: Common Names	CAS NO.	%	OSHA PEL	ACGIH TLV	LD ₅₀ (mg/Kg)
Potassium Dihydrogen Phosphate (KH ₂ PO ₄)	7778-77-0	< 1.0	None Listed	None Listed	None Listed
Potassium Chloride (KCl)	7447-40-7	< 1.0	None Listed	None Listed	3020 (ORL-RAT)
Sodium Hydroxide, NaOH	1310-73-2	< 1.0	None Listed	None Listed	1600 (ORL-RAT)
Potassium ferricyanide (K ₃ Fe(CN) ₆)	13746-66-2	< 1.0	None Listed	None Listed	None Listed
Potassium ferricyanide trihydrate (K ₃ Fe(CN) ₆ 3H ₂ O)	14459-95-1	< 1.0	None Listed	None Listed	None Listed
Deionized Water, H ₂ O	7732-18-5	> 98	None Listed	None Listed	190,000 (IPR-MUS)

III. Physical Data

Boiling Point @ 750 mm Hg	100 °C	Freezing Point	0 °C
pH @ 25 °C	7.00	Vapor Pressure @ 25 °C	NA
Volatiles % By Wt.	NA	Solubility in Water, % by Wt @ 25 °C	Miscible
Vapor Density (Air = 1)	NA	Evaporation Rate (Butyl, Acetate = 1)	NA
Specific Gravity (Water = 1)	1.0	Odor	odorless
Appearance	Light green Liquid		

IV. Fire And Explosion Hazard Data

Flash Point (Test Method)	Not Flammable	Autoignition Temperature	NA
Flammable Limits in air, % by volume		Lower	Upper
		NA	NA
Extinguishing Media	Water, CO ₂ , Dry Chemical , Foam Spray	Special Fire-Fighting Procedures	None, non-flammable
Unusual Fire & Explosion Hazards	None		

* NA – Not Applicable/not available

V. Reactivity Data

Stability	<i>Unstable</i>	<i>Stable</i> X
Conditions to Avoid	None	
Incompatibility (Materials to Avoid)	None	
Hazardous Decomposition Products	None	
Hazardous Polymerization	Cannot Occur	

VI. Health Hazard Data

Routes of Entry	<i>Inhalation</i> Yes	<i>Skin</i> Yes	<i>Ingestion</i> Yes
Health Hazards	<i>Acute</i>	Irritation may occur in case of eye or skin contact. Irritation may also occur to mucous membranes from vapors.	
	<i>Chronic</i>	This substance is toxic to blood, lungs, mucous membranes.	
Carcinogenicity	<i>NTP</i> Not Found	<i>IARC Monographs</i> Not Found	<i>OSHA Regulated</i> Not Found
Signs and Symptoms of Exposure	Irritation		
Medical Conditions Generally Aggravated by Exposure	Could Aggravate Diseases of Skin		
Emergency And First Aid Procedures	If skin contact occurs, wash off contact area with water. If ingested, give large amounts of water. Do not induce vomiting. Contact physician.		

VII. Precautions for Safe Handling and Use

Steps to be Taken In Case Material is Released or Spilled	Dilute with water and set aside for disposal
Waste Disposal Method	Consult Federal, State and Local laws for proper disposal.
Precautions To Be Taken In Handling and Storing	Suitable for any general handling storage. <u>NFPA Rating:</u> Scale (0-4); Health -2, Fire - 0, Reactivity - 0, Specific - None
Other Precautions	Do Not Ingest!

VI. Control Measures

Respiratory Protection (specific type)	None	
Ventilation	<i>Local Exhaust</i> None	<i>Special</i> None
	<i>Mechanical (General)</i> Use in Fume Hood	<i>Other</i> None
Protective Gloves Yes	Eye Protection Safety Glasses	Other Protective Clothing or Equipment None
Work/Hygienic Practices	Emergency eyewash should be available. Wash hands after working with this product	

APPENDIX D

PORTABLE GENERATOR HAZARDS

Consumer Product Safety Commission Safety Alert

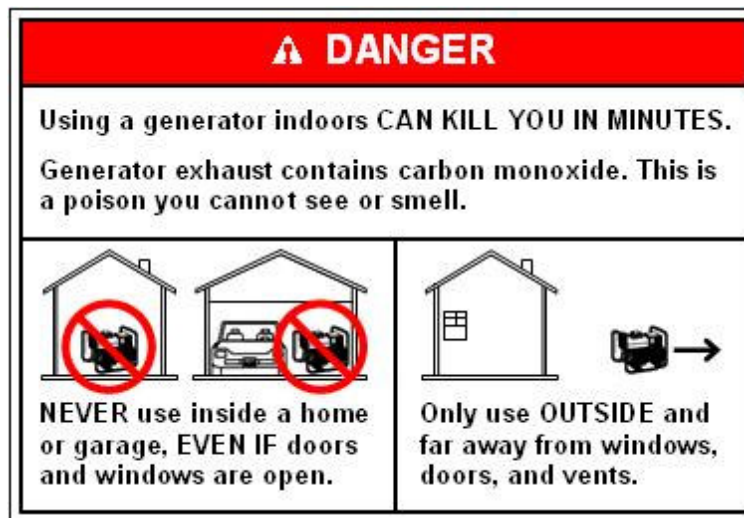
Portable Generator Hazards

Portable generators are useful when temporary or remote electric power is needed, but they also can be hazardous. The primary hazards to avoid when using a generator are carbon monoxide (CO) poisoning from the toxic engine exhaust, electric shock or electrocution, fire and burns.

Every year, people die in incidents related to portable generator use. Most of the incidents associated with portable generators reported to CPSC involve CO poisoning from generators used indoors or in partially-enclosed spaces.

Carbon Monoxide Hazards

When used in a confined space, generators can produce high levels of CO within minutes. When you use a portable generator, remember that you cannot see or smell CO. Even if you do not smell exhaust fumes, you may still be exposed to CO.



Danger labels are required on all portable generators manufactured or imported on or after May 14, 2007.

If you start to feel sick, dizzy, or weak while using a generator, get to fresh air **RIGHT AWAY. DO NOT DELAY.** The CO from generators can rapidly kill you.

Follow these safety tips to protect against CO poisoning.

- **NEVER** use a generator inside homes, garages, crawlspaces, sheds, or similar areas, even when using fans or opening doors and windows for ventilation. Deadly levels of carbon monoxide can quickly build up in these areas and can linger for hours, even after the generator has shut off.
- Follow the instructions that come with your generator. Locate the unit outdoors and far from doors, windows, and vents that could allow CO to come indoors.
- Install battery-operated CO alarms or plug-in CO alarms with battery back-up in your home, according to the manufacturer's instructions. CO alarms should be certified to the requirements of the latest safety standards (UL 2034, IAS 6-96, or CSA 6.19.01). Test batteries monthly.

To avoid CO poisoning when using generators:

- Never run generators indoors, including garages, basements, crawlspaces and sheds.
- Get to fresh air right away if you start to feel dizzy or weak.

Electrical Hazards

- Generators pose a risk of shock and electrocution, especially if they are operated in wet conditions. If you must use a generator when it is wet outside, protect the generator from moisture to help avoid the shock/electrocution hazard, but do so without operating the generator indoors or near openings to any building that can be occupied in order to help avoid the CO hazard. Operate the generator under an open, canopy-like structure on a dry surface where water cannot reach it or puddle or drain under it. Dry your hands, if wet, before touching the generator.
- Connect appliances to the generator using heavy-duty extension cords that are specifically designed for outdoor use. Make sure the wattage rating for each cord exceeds the total wattage of all appliances connected to it. Use extension cords that are long enough to allow the generator to be placed outdoors and far away from windows, doors and vents to the home or to other structures that could be occupied. Check that the entire length of each cord is free of cuts or tears and that the plug has all three prongs. Protect the cord from getting pinched or crushed if it passes through a window or doorway.
- **NEVER** try to power the house wiring by plugging the generator into a wall outlet, a practice known as "backfeeding." This is extremely dangerous and presents an electrocution risk to utility workers and neighbors served by the same utility transformer. It also bypasses some of the built-in household circuit protection devices.

Fire Hazards

- **Never** store fuel for your generator in the home. Gasoline, propane, kerosene, and other flammable liquids should be stored outside of living areas in properly-labeled, non-glass safety containers. Do not store them near a fuel-burning appliance, such as a natural gas water heater in a garage.
- Before refueling the generator, turn it off and let it cool down. Gasoline spilled on hot engine parts could ignite.

5123/0407

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The U.S. Consumer Product Safety Commission is charged with protecting the public from unreasonable risks of serious injury or death from thousands of types of consumer products under the agency's jurisdiction. The CPSC is committed to protecting consumers and families from products that pose a fire, electrical, chemical, or mechanical hazard. The CPSC's work to ensure the safety of consumer products - such as toys, cribs, power tools, cigarette lighters, and household chemicals - contributed significantly to the decline in the rate of deaths and injuries associated with consumer products over the past 30 years.

To report a dangerous product or a product-related injury, call CPSC's hotline at (800) 638-2772 or CPSC's teletypewriter at (800) 638-8270, or visit CPSC's web site at www.cpsc.gov/talk.html. To join a CPSC email subscription list, please go to <https://www.cpsc.gov/cpsclist.aspx>. Consumers can obtain this release and recall information at CPSC's Web site at www.cpsc.gov.

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APPENDIX E

EMERGENCY CONTACTS

Appendix E—Emergency Contacts

EMERGENCY SERVICES

Security (Police/Sheriff)	911
Fire/Rescue	911
Ambulance	911
Caribou Memorial Hospital Emergency Room	208-547-3341
Portneuf Medical Center Emergency Room (Pocatello)	208-239-1800
Star Valley Hospital Emergency Room (Afton, WY)	307-885-5821
Idaho Poison Control Center	800-860-0620

EMERGENCY CONTACT NUMBERS

Vance Drain (MWH Project Manager)	office: 801-617-3250 cell: (b) (6)
Leah Wolf Martin (RI/FS Task Manager)	office: 970-879-6260 cell: (b) (6)
Leland Fuhrig (On Site Safety Officer)	cell: (b) (6)
Barry Koch (P ₄ Production Project Manager)	office: 208-547-1439 cell: (b) (6)
Emergency	911


Note: It may be necessary to dial a '9' to access an outside line at mine sites when calling.

HOSPITAL FACILITIES

The closest hospital and the specific route to the hospital will depend on where field activities are taking place. The following are the hospitals closest to the project sites:

Caribou Memorial Hospital, 300 South 3rd West, Soda Springs, Idaho

(b)(4) copyright



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Appendix E—Emergency Contacts

Portneuf Medical Center (East Campus), 777 Hospital Way, Pocatello, Idaho, At Pine Ridge Mall

(b)(4) copyright



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Appendix E—Emergency Contacts

Portneuf Medical Center (West Campus), 651 Memorial Drive, Pocatello, Idaho

(b)(4) copyright



Appendix E—Emergency Contacts

Star Valley Medical Center
110 Hospital Lane
Afton, Wyoming

307-886-5800 (Information)
307-886-5821 (Emergency Room)
911 (Search and Rescue/Sheriff's Dispatch)

In general, to get to the Caribou Memorial Hospital, proceed to Highway 30 in Soda Springs, which is also known as 2nd South. Proceed to 3rd West, and turn south to 3rd South. To get to the Portneuf Medical Center (East Campus), proceed to I-15 and take the Clark Street exit. The hospital is at the top of a hill and is visible from the freeway. To get to the Portneuf Medical Center (West Campus), proceed to I-15 through Pocatello and take the Clark Street exit. Drive West on Clark, turning South on 15th Street. The West Campus is on the right side. To get to the Star Valley Hospital, proceed to Highway 89 and turn onto Hospital Lane. When making calls from mine offices, it may be necessary to dial '9' to access an outside line.

APPENDIX F

ACKNOWLEDGEMENT FORM

PERSONAL ACKNOWLEDGMENT FORM

HEALTH AND SAFETY PROGRAM

PROGRAM OR SITE

As a component of the Health and Safety Plan designed to provide personnel safety during the investigation of the southeast Idaho phosphate resource area, you are required to read and understand the Health and Safety Plan. When you have fulfilled this requirement, please sign and date this personal acknowledgment form, and return the form to the On-Site Safety Officer.

Signature

Name (Printed)

Date

APPENDIX G

MONSANTO CONTRACTOR/GUEST ES&H SITE GUIDELINES



6.0 Contractor/Guest ES&H Guidelines

6.1.0 CONTRACTOR MANAGEMENT SYSTEMS

Contractors shall provide a full time Safety Representative in the following conditions:

- a.) When the contract company has 10 or more employees on site.
- b.) If they have less than 10 employees but the job has been defined as a high-hazard job through and ESH review, or if required by the Contractor Safety Specialist.
- c.) The full-time Safety Representative shall:
 - Have a minimum of three years experience in construction safety and have passed the OSHA 30 Hour Construction Course.
 - Must have Accident/Incident Investigation Skills
 - In some incidences, First Aid/CPR certification.
- d.) The Safety Representative shall be responsible for all subcontractors, and to ensure they are following ESH requirements.
- e.) The Safety Representative's primary responsibility will be to continuously monitor the contractor's personnel, the contractor's subcontractor personnel and equipment to ensure compliance with all applicable ESH requirements.
- f.) If the Safety Representative does not demonstrate the ability to perform his/her work to the satisfaction of the Monsanto Representative, the Monsanto Representative may ask that this person be replaced by another Safety Representative meeting the criteria listed above.
- g.) The Safety Representative must have the authority to correct any hazard or unsafe practice on the project, even if a work stoppage is required.



6.0 Contractor/Guest ES&H Site Guidelines

6.1.1 EMERGENCY RESPONSE

Purpose:

This plan provides for the immediate organization of all efforts to prevent injury to personnel, damage to property and the environment, and to ensure accountability of employees.

Scope:

The plant Emergency Plan shall be used for any abnormal incidents that may occur inside of the Soda Springs Site including, but not limited to, personnel injury, or serious property or environmental releases, which have the potential to impact the surrounding community.

General:

Plant emergencies can be reported to PROVOX operators by dialing 777 on any plant telephone or by using plant radios.

The Plant Emergency Plan identifies two levels of plant emergencies:

Level One- Emergencies controlled by the on-site emergency response team.

Level Two- Any plant emergency that requires more resources than are available in the plant and/or environmental incident that would impact the surrounding area.

When upgraded to a level two incident, the furnace or kiln PROVOX Operator will be instructed to activate the plant emergency sirens, initiating plant headcount procedures.

The emergency sirens are tested every Friday at 12:00 noon.

HEADCOUNT:

When the sirens are activated, Mark III will report to the Mark III Shop for headcount.

On weekends, holidays and night shifts, Mark III personnel assigned to manufacturing areas should report to the designated manufacturing headcount area.

Temporary contractors/visitors are to report directly to the guard station used for entry into the plant (East ext. 1310 or West ext. 1480) for headcount reporting.

NorthWest Cleaning personnel assigned to work in remote areas of the plant (Furnace Office, E&I Shop, etc.) should immediately phone East Security to report headcount and receive further instructions.

If the contractor/visitor cannot report to the assigned guard station, proceed to the closest designated area (listed below) and report by phone or radio to your assigned area (the guard station). The CMR assigned to the contractor/visitor is responsible to inform them of emergency procedures and if possible escort them to the assigned headcount.

Plant Headcount Areas

1. #8 & 9 Furnace Tapping Lunchroom
2. #7 & 8 Furnace Operating Level Lunchroom
3. Phos Dock Lunchroom
4. Main Shop Lunchroom
5. Machine Shop Lunchroom
6. Electric Shop Lunchroom
7. HEG Lunchroom
8. Department 10 Lunchroom
9. Mark III Shop Lunchroom
10. Security Office (East Entrance)
11. Security Office (West Entrance)
12. Admin. Building Multipurpose Room #59
13. Storeroom Conference Room

Evacuation:

In the event the evacuation becomes necessary, the emergency plan indicates two levels of evacuation:

Partial Evacuation-Instructions will be delivered via radio, telephone or runner.

Full Site Evacuation-The emergency sirens will be activated a second and third time. Indicating the need for all personnel to proceed to the assigned evacuation collection areas as listed below:

Plant Evacuation Collection Areas

South Area: (As indicated by the assigned CMR)

Primary - Administration Building Multi-Purpose Conference Room.
Secondary - HEG Shop

North Area: (as indicated by the assigned CMR)

Primary - HEG Shop
Secondary - Administration Building Multi-Purpose Conference Room.

If you are outside of, or cannot safely reach your designated collection area, proceed to the assigned secondary collection area and report by phone or radio.

The CMR assigned to the contractor/visitor, if possible, should escort them to the assigned evacuation collection area.

EMERGENCY EQUIPMENT:

1. The use of designated fire equipment for activities other than fire fighting is prohibited.
2. Know the location of, and how to use, emergency equipment in the area where you are working. Emergency equipment includes safety tubs, showers, eye wash stations, stretchers, positive air equipment and fire extinguisher.
3. Any contractor performing work on a fire protection system must first obtain an Impairment Permit from the Safety Department. Fire protection systems include fire water supply systems, sprinkler systems, FM-200 systems, etc.
4. Never block emergency equipment such as fire hydrants, hoses, extinguishers, emergency vehicles etc.



6.0 Contractor/Guest ES&H Site Guidelines

6.1.3 TRAINING

1. Contractors shall instruct each employee in the recognition and avoidance of unsafe conditions and regulations applicable to his/her work environment to control or eliminate any hazards or other exposure to illness or injury.
2. Contractors shall maintain records of all employees training. Training records shall contain, as a minimum:
 - a.) Name and signature of the employee
 - b.) Date of training
 - c.) Subject and content of the training
 - d.) Means used to verify that employee understood the training
 - e.) Name of the instructor
3. When requested, the Certified Monsanto Representative shall be provided with documentation and certification of contractor training. In addition, the contract company must assure that all employees have the appropriate job skills, knowledge and proper technical certifications necessary to perform their work safely. Some certifications may include but are not limited to: Certified Welders, Crane Operators, Qualified Electrical Workers and Qualified Riggers. Monsanto reserves the right to audit Contractor Safety Training.

The document user is responsible to **MAKE SURE PRINTOUTS ARE OF THE CURRENT REVISION**, prior to using them.
Soda Springs Contractor/Guest ES&H Guidelines 6.0 Site Requirements Document ID #CG001 Revision 11
DOCUMENT CONTROL INFORMATION: Document ID #CG001-Rev 11
SODA SPRINGS CONTRACTOR GUEST ES&H Guidelines 6.0 Site Requirements
APPROVER: KIRBY, MATT K. - Contractor Safety Specialist
REVISION COMMENTS: Update procedure to current practices.



6.0 Contractor/Guest ES&H Guidelines

6.1.4 ENGLISH PROFICIENCY

1. All contractors must have the ability to read and speak English in order to perform their work safely.



6.0 Contractor/Guest ES&H Site Guidelines

6.2.0 WORKING IN AN OPERATING UNIT

Department Hazards

1. No one shall enter another department to perform work or use that department's equipment without first obtaining permission from that department's Operating Crew Supervisor.
2. No unauthorized person should ever start up or shut down a piece of equipment in any department (unless danger to another person's life exists).
3. Owning department will be responsible for clearing/isolating all process lines as well as initiating any and all required hazardous work permits.
4. Never reach under or between belts, pulleys, idlers, rollers, chains, gears, etc., unless the equipment is locked out.
5. Equipment shall not be operated without proper guards and safety chains in place.
6. Only qualified members of the Monsanto Electrical Department will open electrical boxes to remove fuses, energize resets or to perform other electrical functions. Electrical contractors must first get clearance from the Monsanto Electrical Department to perform any electrical work. The use of Ground Fault Circuit Interrupters is required when using tools.
7. Due to the high potential of injury resulting from the uncontrollable whipping of an air hose, which has unexpectedly uncoupled, whip checks will be required when using tools such as jackhammers and air drills.
8. Whip checks are also required when doing any high pressure water blasting. There are two types of whip checks available from the plant Storeroom.

9. All snap-on hose connections must be secured by wire pins.
10. No one shall use compressed air to clean his or her clothing or body. Compressed air shall not be directed toward anyone.
11. Compressed air shall not be used for cleaning purposes except when reduced to less than 30 P.S.I., or when a venting device is used along with all appropriate personal protective safety equipment. Note: Use industrial vacuums whenever possible.
12. Department Supervisor's approval must be obtained before using steam or air to unstop a pipe or line.
13. When working with Soda Ash or Lime; goggles and dust mask or respirators with Hepa filters are required.
14. Any cam-lock fitting used on Soda Springs Sites must be secured with a secondary safety device such as wire ties, pins, etc., or other means to prevent inadvertent disconnection.



6.0 Contractor/Guest ES&H Site Guidelines

6.2.1 OFFICE SAFETY

1. The following items, while not intended to be all-inclusive, are indications of some of the areas of concern for good office safety:
 - a. Never carry pencils with points exposed in shirt pockets.
 - b. Report spills, slipping and tripping hazards to the supervisor immediately. Clean up or correct them as soon as possible.
 - c. Keep all machinery guards in place.
 - d. Never leave paper cutter arm in an up, or open position.
2. The following items, while not intended to be all-inclusive, are indications of some of the areas of concern for good office housekeeping:
 - a. Do not store used equipment in office.
 - b. Do not stack large amounts of paper, and other items, on the tops of file cabinets, bookcases and tables.
 - c. Clear desk and table tops at the end of each workday.
 - d. Use coat racks or closets for coats and surplus clothing.
 - e. Limit wall hangings to what is appropriate.



6.0 Contractor/Guest ES&H Site Guidelines

6.3.1 BASIC ENVIRONMENTAL SAFETY AND HEALTH RULES

Working safely is a condition of employment at this plant. Each employee (Monsanto & Contractor) must comply with the plant's safety rules and policies. Knowledge of these specific rules and policies is mandatory in order to perform work safely. In general, plant rules are provided to help insure everyone's safety. The following site-specific rules are provided to address specific safety concerns that are unique to our plant.

1. The best insurance against incidents and injuries:
 - a) Know the job, the pertinent safety rules and area hazard.
 - b) Keep focused, and your mind on the work at hand.
 - c) Use common sense.
 - d) If you can't do it safely, don't do it.
 - e) If you don't know, don't be afraid to ask.
2. Only approved hard hats (ANSI 289.1-1969), which are equipped with goggles, shall be worn inside the plant.
3. Long hair below the nape of the neck must be pinned up or worn in a ponytail.
4. Radios, televisions, and cameras require permission from the Site Manager before being brought into the plant. The use of a cell phone camera for taking pictures requires permission from the Site Manager.
5. All individuals have a direct responsibility to immediately report unsafe acts or conditions to supervision. This includes reporting any near misses including, but not limited to: unexpected equipment condition, defeated

safety systems, or other process safety or personal safety items. If a potential injury is imminent, an attempt must be made to stop the unsafe act or condition, and report it through the use of the corrective action form.

6. It is the responsibility of the CMR to explain area hazards to the contractor before the contractor performs any work.
7. All "Hot" work will cease if the plant disaster alarm is sounded. (This includes cigarette smoking).
8. Eating or drinking is prohibited in production areas (designated eating areas are provided).
9. Contractors must observe safety signs while on Monsanto property.
10. Contractors performing work inside the main office, service building, laboratory or storeroom, will wear the appropriate safety protection (to be identified by the Safety Department).
11. Always use handrails when going up and down stairs. Remember the 3-point contact.
12. Objects or equipment must never be placed within 3 feet of electrical boxes or disconnects.
13. Equipment shall not be operated within 15 feet of power lines.
14. A full-face cutting hood or a face shield with goggles is required when using a cutting torch.
15. A face shield with goggles is required when doing any kind of grinding, cutting, sanding, water blasting, sawing, hammering or chipping that might have the potential for flying debris.
16. BUTANE lighters are not allowed in the plant.
17. No one under the age of eighteen may work on Monsanto property. This includes contractors and sub contractors.
18. Contractors should avoid strains when lifting by keeping their back as nearly upright as possible, using leg muscles instead of the back and stomach muscles. They should not attempt to lift more than 50 lbs per person without assistance.

PERSONAL CONDUCT:

Certain rules of personal conduct on the job are necessary for the successful operation of any organization. Some of the things that are prohibited while on Monsanto property are:

1. Smoking at Safety Meetings, in offices, or at any Monsanto function being conducted indoors.
2. Bringing intoxicating liquor or narcotics into the plant, or entering the plant under the influence of liquor or drugs, drinking or using narcotics on company property.
3. Bringing firearms or any type of explosive into the plant unless approved by the Site Manager.
4. Engaging in fights, horseplay, practical jokes or indecency.
5. Willfully damaging plant or personal property.
6. Using threatening or abusive language toward fellow employees or supervision.
7. Stealing.
8. Gambling on plant property.
9. Posting notices on company property without prior approval of Plant Management.

The above general rules cannot possibly cover all situations that might arise. As a rule of thumb however, it can be assumed that contractor/visitors are not to engage in any activity that interferes with another employee's or group of employees work, or engage in activity that interferes with the normal continuity of plant operations or the maintenance of order on its premises.

JEWELRY POLICY:

1. Rings, metal band watches, bracelets and necklaces will not be worn in the plant, quarry, storeroom, lab or mine.
2. Rings, metal band watches, bracelets and necklaces will not be worn when performing maintenance/electrical work on plant property.

3. Hoop: earrings, nose-rings and brow-rings will not be worn in the plant, mine quarry, storeroom or lab or when performing maintenance/electrical work on plant property.
4. Stud jewelry is allowed.
5. Medical alert necklaces and bracelets are allowed, and will be kept under clothing when performing maintenance.

CELL PHONE POLICY - such as talking, texting, and gaming is PROHIBITED:

1. When driving any motorized vehicle on Monsanto property.
2. When walking in "out of office" areas throughout plant and remote sites. (Take the call only when stopped in a safe area.)
3. When working in an area where a hazardous work permit exists; however, in this circumstance, a cell phone may be used for business and/or emergencies only.
4. Employees, contractors and visitors are asked to use good judgment when using their cell phones in manufacturing areas of the Soda Springs plant. Do not allow a cell phone to distract or otherwise cause inattention while performing a task. Keep your mind on your work until you can safely answer a call.
5. The best time to use cell phones for personal business is break time.

BARRICADE TAPE POLICY:

All excavations, holes in floors, areas where work is being performed overhead or temporary work areas where tripping or falling hazards exist will be covered over, roped off, or barricaded off. It is important that the proper barricade tape in conjunction with the proper tag be used when barricading an area. The Soda Springs plant uses two types of barricade tape: yellow & black barricade tape and orange barricade tape.

All barricade tape must be tagged with either a DANGER tag or a CAUTION tag. The DANGER tag or the CAUTION tag must include a description of the hazard, be signed by the person establishing the barricade, be placed on the barricade tape and be spaced frequently enough for easy identification.

1. Orange barricade tape is to be used to barricade an area, which has been determined to be hazardous for entry. Orange barricade tape is considered the same as a lockout. Once the orange barricade tape has been put up, NO ONE IS ALLOWED TO ENTER THAT AREA, not even

the person who applied the barricade tape. A DANGER tag must be attached to the barricade tape as described in #3 of this section. CAUTION tags are NOT to be used with orange barricade tape. Once the hazard has been identified and all safety precautions are taken to correct the hazard, the orange barricade tape can be taken down and replaced with yellow & black barricade tape (if necessary) so that work can proceed.

2. Yellow & black barricade tape is used to identify an area where a hazardous condition may exist. Either CAUTION or DANGER tags, as described in #3, may be used with yellow & black barricade tape.
3. CAUTION tags are used, entry into the barricaded area may occur, after reading the warning on the CAUTION tag. If DANGER tags are used, entry into the barricaded area can only occur after requesting permission from the person who established the barricade. If work proceeds beyond shift change, the CAUTION or DANGER tags must be replaced and signed by the oncoming shift.
4. All barricade tape is to be promptly taken down when the reason for the barricade no longer exists. Barricade tape is to be placed in trash containers when it is removed. Barricade tape is NOT to be left lying on the ground in the work area.
5. All open holes in the floor must be surrounded by barricade tape.

PEDESTRIAN TRAFFIC:

1. Pedestrians must use designated walkways and be aware of the beeping signal from backing equipment. They should also be aware of the limited visibility of heavy equipment operators.
2. Stay a safe distance from a moving piece of equipment until the attention of the operator has been gained.
3. Running up or down stairways or throughout the plant unnecessarily is not allowed.
4. Do not sit on handrails or lean on safety chains.
5. Never enter pot carrier area, nodule stockpile area, or the belt filter press cake/ore screen house area, without proper clearance.

RAILROAD SAFETY:

1. Cross railroad tracks only at regular crossings provided for that purpose. If railroad cars are blocking a road or passageway, do not climb over, between, or under them instead, walk around them.

2. You should allow at least eight feet of clearance between you and the car. This rule is in effect at all times whether or not a switch is being made. Anyone violating this rule will be subject to disciplinary action.
3. No one shall place material, equipment or do work within 8 feet of the center line of any railroad track without first contacting the Material Handling Department and/or Phos Dock personnel to have the tracks Blue Flagged and Locked Out.

BLUE FLAG

1. Whenever anyone is working around a railroad car at the phos dock, railroad shop, coke bunker(s), or anywhere on the plant tracks, a Blue Flag must be in place on the southernmost car on the affected track.
2. Keep derail closed at all times except when switching railroad cars.
3. Chock the wheels on lead car on a downgrade.
4. Any person(s) working in a railroad car area shall use a Blue Flag sign. Ownership and clearing of plant railroad tracks will be as follows:

RR track ownership:

Heavy Equipment Group – Track 721, commonly known as track #1.
Phos dock – Track 722, commonly known as phos loading track #2.
Reliability group (Railroad Shop) – Track 723, 724, 728.

Note: Work by the (authorized) **owning track group** requires a Blue Flag only.

Note: Work by the (affected) **non-owning employees** requires the use of some type of control method in addition to the blue flag. For example, a tag lock and tag, or lockbox must be used by both the owning track group and non-owning employees. This will ensure that all involved groups are recognized and that communication is maintained.

5. In the event that work is to be performed on a track by a group other than the owner, contact must first be made with the track owner and lockout tag affixed to the blue flag.
6. Persons needing to work across or within eight feet of the phos loading track shall contact the phos dock Crew Supervisor or backup, and fulfill the following requirements.

- a. The phos dock will place a tripod Blue Flag sign at the south end of the phos loading track. The phos dock and persons performing the work on or near the tracks must lock out the car puller if there are any cars to the north of where the work is to be performed.
- b. Skates or chocks will be used on the first car on either side of the work area.
- c. Non-phos dock person(s) performing the work will affix a lockout tag bearing his/her name to the Blue Flag tripod sign. This is necessary to move rail cars before the work is completed. If a lockbox is being used then a tag must be affixed to the blue flag indicating that a lockbox is being used.
- d. Work should be completed as promptly as possible to minimize any impact on loading and switching activities. When work is complete and the tracks clear, notification should be made immediately to the phos dock. The lockout tag must be removed from the tripod sign and the car puller if locked should be unlocked.
- e. In the event that work extends beyond the end of the phos dock personnel's shift, a special written permit will be issued by the phos dock to authorize removal of the Blue Flag. This permit will contain a checklist for the person removing the Blue Flag who may not be familiar with the procedure to assure that the track is cleared.
- f. No one may remove a Blue Flag from the phosphorus-loading track other than the phos dock or the holder of a written permit.
- g. No one shall remove a Blue Flag bearing a lockout tag.

WORK-IN PROGRESS/ PERFORMANCE EVALUATIONS:

- Contractors must participate in work-in-progress audits when asked to by the Monsanto Representative.

WAPITI/ BEHAVIORAL BASED SAFETY PROCESS:

- Contractors will be asked to participate in the BBS Process.
- The BBS process identifies behaviors, which may lead to an injury or property damage.
- BBS is part of the safety culture and is an important part of changing an unsafe act.

HAZARDOUS ENTRY AND GENERAL ENTRY PROCEDURES:

A properly completed and approved hazardous work permit is required prior to performing hazardous jobs, entering vessels or entering designated confined spaces in the plant. The department Crew Supervisor may issue hazardous work permits or a responsible operator, provided the conditions of the hazardous work permit can be met. Otherwise, the job must stop until the permit can be properly completed and approved or a special written clearance is obtained.

1. Hazardous work permits are only valid during the shift in which it was created. If the work proceeds past the end of the shift, a new hazardous work permit must be completed.
2. Hazardous work permits must remain at the job site until completed and then should be returned to the operating crew supervisor.
3. Only Monsanto Employees are authorized to start/stop equipment or open/close valves. When these steps are needed, contact your assigned CMR.

NOTE: Nitrogen and inert gas are used to purge oxygen from most vessels in the plant. Inert gas sometimes contains hazardous amounts of Carbon Monoxide. Breathing pure nitrogen or inert gas can be fatal.

Permits:

There are many different permits in this plant that have been developed to assist in performing safe operations. It is the responsibility of each individual to know when and where a permit is required to perform a job. If in doubt about the need for or use of a permit, ask the CMR who represents you. Listed below are some of the permits that are used at this site. This list is not all-inclusive other permits maybe necessary and your assigned CMR will assist you in determining permits you need to complete your assigned work:

1. Hot Work Permit
2. Work Execution Permit
3. Confine Space Entry Permit
4. Line Entry Permit
5. Lifting Personnel with Crane Permit
6. Elevated Work Permit
7. Excavation Permit



6.0 Contractor/Guest ES&H Site Guidelines

6.3.5 INJURY AND ILLNESS RECORDKEEPING AND REPORTING

The Plant Dispensary is available for initial treatment of injuries, which occur on company property. The plant has a trained 24 Hour Emergency Response Team and EMT's for rescue work. Call 777 for emergency first aid support. Be sure to give your name, the location of the injured, and, if possible, the extent of the injury. Go or send someone to direct the emergency crew to the exact location of the injury.

1. Contractors/visitors are required to immediately report all injuries, no matter how small, to the CMR and Safety Department or on-shift EMT. A First Aid card (blue/Contractors) must be filled out immediately for any first aid or injury. Any transport to the hospital requires a blue first aid card to accompany the injured/ill employee. MD information is required on the back of the card. The first aid cards are located in the Administration Building Dispensary. The CAF (corrective action form) is attached and must also be submitted.
2. Contractors are required to submit a monthly Man-Hour & Illness/Injury Report to the Contractor Safety Specialist.
3. If you are personally exposed to blood/body fluids, immediately wash exposed area with soap/water, isolate the contaminated area, call EMT's to perform decontamination, and report exposure to the Safety Department.
4. If blood/body fluids are discovered (without personal exposure), isolate the area from other personnel and call Plant EMT's to perform decontamination procedures.



6.0 Contractor/Guest ES&H Site Guidelines

6.4.4 MONSANTO SECURITY POLICY

1. Contractors and their employees normally will be governed by the terms of their particular contract. In all cases, contractor's personnel are confined to the area in which they are working.
2. Contractors and their employees will use the entrance and exit gate, which has been designated by Monsanto.
3. Service Representatives and Service Company employees who are not under a formal contractual arrangement will be registered in and out. The plant guards will administer the above policy and enforce the necessary rules required to carry it out.
4. Contractor parking facilities will be separate from Monsanto Employee parking.
5. An approved Material Pass will be required for contract employees and visitors when leaving company property with bundles, packages, boxes, materials, equipment, etc. Plant guards may periodically inspect packages, even though the individual may have a Material Pass. Lunch boxes do not require a pass, but must be opened for inspection upon request. Vehicles leaving the plant are also subject to inspection at any time.
6. Each contractor's employees and/or visitors will be required to identify him or herself when entering or leaving company property. This shall include signing the log in the guard station.
7. Only the Plant Manager or their delegate can authorize the use of cameras, camera equipment or cell phone cameras. They will not be permitted within the plant without this authorization. Any photographs or video taken of the facilities will need the same authorization.



6.0 Contractor/Guest ES&H Site Guidelines

6.9.1 SUBSTANCE DETECTION

General Requirements:

In the general requirements for Low-Risk and High-Risk contractors, refer to 5.0 Contractor/Guest ES&H Guidelines, 5.9.1 Substance Detection.

This policy is in effect for all Monsanto Soda Springs locations including the Rock Springs, Wyoming Calcliner facility, and all affiliated off-site mining operations and properties (hereinafter referred to as Soda Springs Facilities).

Contractors that do not have a substance abuse policy consistent with these guidelines will not be allowed in a Soda Springs facility without a Monsanto management exception.

All contractors have been classified into one of two categories, High-Risk or Low-Risk. This classification was determined as to the type of work that the contractor performs at Soda Springs Facilities.

Requirements for Both Low-Risk and High-Risk Contractors:

Low-Risk and High-Risk contractors must maintain a copy of an executed **Substance Abuse Policy Statement (Exhibit A)** for each contract employee who works at a Soda Springs Facility; and

Low-Risk and High-Risk contractors must present at the time of site orientation an executed **Substance Abuse Policy Statement (Exhibit A)** for each contract employee undergoing site orientation.

If the Certified Monsanto Representative (CMR) suspects any contract employee is impaired due to alcohol, drugs or other substances, that contract employee will be asked and required to immediately leave the Soda Springs Facility and not return until that contract employee has undergone a substance abuse test verifying that he or she is, in fact, substance free.

Additional Requirements for High-Risk Contractors:

- A. Testing Program: All High-Risk contractors must implement one of the two following substance abuse testing programs, although please note that Monsanto prefers that its High-Risk contractors implement the first option:

Option One: Contractor must execute and provide to Monsanto the **Contractor Employer Substance Abuse Verification (Exhibit B)** and must implement a substance-abuse testing program that contains the following elements:

1. Prior to Working at Soda Springs Facilities – Contractor must have a program that documents that each contract employee working at a Soda Springs facility has passed a substance-abuse test prior to that individual starting work at any Soda Springs Facility.
2. Random Testing – Contractor must have a documented program providing evidence that at least 35 percent of its work force who have worked at Soda Springs Facilities has been randomly tested during the prior year. The testing of the 35 percent must occur evenly over an annual time frame. Testing all personnel on a single day does not qualify as random.

Option Two: Contractor must execute and provide to Monsanto the **Contractor Employer Substance Abuse Verification (Exhibit B)**. Within 15 days prior to any contract employee beginning work at the Soda Springs Facilities, and within six months of any previous test, Contractor must test that individual and maintain executed **Contractor Employee Substance Abuse Verification(s)** for that test(s). Contractor will provide to Monsanto a copy of the executed **Contractor Employee Substance Abuse Verification (Exhibit C)** at the time of that individual's site orientation. This testing requirement applies for as long as the contract employee continues to work at the Soda Springs Facilities. If there is a 45-day lapse in any assignment to the Soda Springs Facilities for any particular contract employee, contractor must test that individual within 15 days prior to him or her restarting work at the Soda Springs Facilities.

- B. Test Requirements: The substance abuse testing conducted pursuant to the above guidelines must be for the following listed substances (or other such substances as indicated in writing by Monsanto) at levels set forth in the Federal Register of Health and Human Services Guidelines published in the Federal Register on April 11, 1988 [53 F.R. 11970], and any amends thereto.

Amphetamines
Cannabinoids (THC)
Cocaine Metabolite
Opiates
Phencyclidines

All tests shall be performed in a Substance Abuse and Mental Health Services Administration (SAMHSA) certified laboratory.

C. Positive Results: If a contract employee tests positive for substance impairment or contractor suspects a contract employee of substance impairment, contractors shall:

1. Immediately remove the contract employee from the Soda Springs Facilities.
2. Inform the CMR Leader and Purchasing Lead.

A contract employee who has tested positive for substance impairment shall not be allowed to return to the Soda Springs Facilities until the CMR Leader or Purchasing Lead has been provided verification and documentation that the contract employee has successfully completed a recognized substance abuse rehabilitation program.

EXHIBIT A

SUBSTANCE ABUSE POLICY STATEMENT

Employee Name: _____

Contractor Name: _____ ("Company")

In connection with your employment, you may be assigned to work on the premises of Company's client, Monsanto Company ("Monsanto").

The use, possession, sale and distribution of alcohol or controlled, illegal or unauthorized substances, or the presence of an individual testing positive under Company's drug testing programs for such substances for non-medical reasons, are prohibited on any Monsanto work location, including project sites. Illegal drugs include, among others, marijuana, hashish, heroin, crack/cocaine and hallucinogens.

Entry to any Monsanto work location, including project sites, offices and vehicles, is conditional on Monsanto's right to search the entrant's personal effects and vehicle for prohibited drugs and paraphernalia, alcoholic beverages, or possession of unauthorized property or equipment. The Certified Monsanto Representative (CMR) has the right to remove any contract employee from any of the Soda Springs Facilities until a substance abuse test can verify that the contract employee is in fact substance free.

Violation of this policy or refusal to submit to a search or drug testing will be cause for immediate termination of Permission/Authorization to work on Monsanto's premises. I agree to abide by Monsanto's reasonable suspicion.

I HAVE READ AND UNDERSTAND THE ABOVE POLICY.

Employee Signature

Date

EXHIBIT B

CONTRACTOR EMPLOYER SUBSTANCE ABUSE VERIFICATION

I hereby certify that our Company substance abuse program meets the standard set forth in the Monsanto Soda Springs site-specific document 6.9.1 as outlined in Option One or Two. I also agree to periodic audits of our substance abuse testing program to provide evidence that the program is in conformance.

Our selected option for the Soda Springs Site High Risk Contractor is:

Option One_____

Option Two _____

Name of Contract Company:_____

Printed Name:_____

Signature:_____

Title:_____

Date:_____

Please fax or return the above information:

**Monsanto Company
Attn: Matt Kirby
(208) 547-1253 Office
(208) 547-3763 FAX
sodasprings.contractor-guest@Monsanto.com**

EXHIBIT C

CONTRACTOR EMPLOYEE SUBSTANCE ABUSE VERIFICATION

Name of Employee: _____

Last four digits of Social Security Number: _____

Date Sample Taken: _____

Name of Testing Laboratory: _____

Test Utilized: _____

Negative Test Results* Yes _____ No _____ *Do Not Send Actual Test Results

**I HEREBY CERTIFY THE ABOVE TEST RESULTS TO BE CORRECT
TO THE BEST OF MY KNOWLEDGE.**

Name of Contract Company: _____

Printed Name: _____

Signature: _____

Title: _____

Date: _____

Please fax or return the above information:

**Monsanto Company
Attn: Matt Kirby
(208) 547-1253 Office
(208) 547-3763 FAX
sodasprings.contractor-guest@Monsanto.com**

APPENDIX H

PRE-JOB ANALYSIS WORKSHEET

Monsanto – Soda Springs Plant

Pre-Job Risk Analysis

Job #	
Date:	
Work Area:	

Work area inspected and the following hazards corrected:	
--	--

Work Team Signatures:				

Job Name/Title:	
-----------------	--

Major Job Steps (Each major step is written below in this column)	Potential Risks (Run each job step thru the following list, identifying risks by entering the job step number from the prior column)	Prevention Plan (All risks identified from the previous column must have a prevention plan noted here, and detailed on the job order)
1.	Lockout/Tagout	
	Atmospheric Monitoring	
2.	Barriers/Guards	
	Housekeeping	
3.	Permitting	
	Head/face/neck protection	
4.	Eye Protection	
	Body Protection	
5.	Hand/Arm Protection	
	Legs/Feet Protection	
6.	Respiratory Protection	
	Fall Protection	
7.	Hearing Protection	
	Pinch Points	
8.	Lifting	
	Ascend/Descend	
9.	Line of Fire	
	Working Surface	
10.	Ergonomics	
	Work Pace	
11.	Tool Selection/Condition	
	Vehicle Inspection	
12.	Vehicle Operation	
	Assistance	
13.	Communication	
	Environmental Risks	
14.	Chemical Safety/MSDS	
	Electrical Clearance	

APPENDIX I

DEGERSTROM ORE HAULROAD TRAVEL REQUIREMENTS



ORE HAULROAD TRAVEL REQUIREMENTS

VISITORS

Haulroad Safety

There are two different types of haulroads used by Degerstrom Ventures. The system of roads used for the hauling of materials between the pit and dumps or pit and ore stockpile. This system is referred to as simply haulroads. The other type of haulroad is the Ore Haulroad which is a 19 mile paved haulroad used for hauling ore from the tipple to the ore stacker near the Monsanto Plant Site.

Both of these haulroads share some safety rules but also have some safety rules that are specific to that particular road. It is important to understand the differences between these two road systems and obey the traffic rules that assure personal safety and help maintain safe haulroad traffic.

Sections of the haulroads in the mine are shared through a co-operative agreement with Agrium. These present additional hazards and restrictions that are also addressed in this section.

Right hand traffic is observed on all roads to, from and at the mine; unless otherwise posted. Large pieces of mobile equipment have very limited visibility, large blind spots, and often have extremely long stopping distances: so be aware of this and give mobile equipment plenty of room when approaching them from any direction. It is important to be cautious, pay attention to what is going on around you at all times and particularly avoid equipment in blind spots. Always stay in areas where you can see the operators of mobile equipment – ***“See & Be Seen”*** when traveling on all roads in and around the mine. *If you cannot see the operator, the operator cannot see you.*

General Haulroad Safety Rules

- 1) Obey all posted speed limits.
- 2) Obey all posted warning, advisory, and traffic signs.
- 3) Always wear seatbelts.
- 4) Watch for wildlife crossing.
- 5) Always drive with headlights on.
- 6) Adjust your speed for weather and road conditions.
- 7) Loaded haul trucks have the right of way.
- 8) Always assume that unless you can see the operator they cannot see you.
- 9) Give plenty of clearance to all mobile equipment. Remember: large equipment has very limited visibility and large blind spots.

- 10) When following a haul truck stay far enough back that you can see the driver's side mirror, that way the operator can see you.
- 11) Never approach mobile equipment from the rear. Avoid this large blind spot and approach from the driver's side. Never park directly behind any mobile equipment.
- 12) Be alert for material that may fall off the beds of loaded trucks.
- 13) Never drive past, over or around any type of road barricade.
- 14) Pay attention to horns, alarms and signals on all mobile equipment.

Ore Haul Road

The Ore Haul Road runs from the tippie at the mine to the unloading facility at the plant. This paved road was designed for ore hauling, but the upper portion above the Blackfoot River Road/Ballard intersection serves as the access road to the mine. Traffic between the Ballard intersection and the plant is restricted to ore trucks, service equipment, and small vehicles equipped with the proper two-way radios. All other vehicles must make prior arrangements and/or be escorted.

The Ore Haulroad crosses the Blackfoot River Road at Ballard. Traffic at this intersection is controlled by traffic lights. These lights regulate traffic on the Blackfoot River Road to allow the ore trucks to proceed through the intersection safely, without stopping. This is very important to the operation of the ore trucks, especially when the trucks are loaded with 210 tons of ore. The traffic lights are triggered by trips set in the asphalt prior to the intersection and cycle through a preset time, which allows the ore trucks to pass through the intersection before the lights change. It is important to avoid driving over the trips and triggering the traffic light cycles, tripping them may effect the cycle time and interfere with an approaching ore truck. The trips are clearly marked on the asphalt and with signs. The ore trucks have the right of way, so avoid driving over the trips, stay clear of approaching traffic, and any ore trucks that may be following behind you.

Ore trucks may be parked on the ore haul road during lunch break and if they are experiencing mechanical problems. When you are approaching these parked trucks slow down and use caution, the operator or mechanics may step out from under or around these parked trucks.

Ore Haulroad Safety Rules

- 1) Obey all posted speed limits.
- 2) Obey all posted warning, advisory, and traffic signs.
- 3) Always wear seatbelts.
- 4) Always drive with your headlights on.
- 5) Watch for wildlife crossing.
- 6) Adjust your speed for the weather and road conditions.
- 7) Ore trucks have the right of way.
- 8) Stay as far to the right as possible when traveling the Ore Haulroad, especially when meeting ore trucks.
- 9) Use extreme caution when passing an ore haul truck. Never pass on corners or hills where visibility is limited.
- 10) Avoid driving over the traffic light trip at Ballard and Conda crossings.

- 11) Never park on the paved portion of the haulroad. Always park in a spot that is clear from traffic. In case of a mechanical problem, park as far to the right as possible and turn on emergency flashers.
- 12) Slow down and use caution when approaching and passing ore trucks that are stopped on the ore haulroad. Operators and mechanic may be walking around these stopped trucks.

Haulroads at the Mine

There are numerous roads throughout the mine itself. These roads are used for a variety of purposes such as, to accessing various areas of the mine, drilling & blasting, and surveying. The haulroads are designed for specifically for the hauling of mine ore and waste materials.

The traffic patterns on these roads change continually during each shift, as needed. The basic rule here is to stop before entering these roads, look at the flow of the traffic and then follow. This has been posted at main entrances to haulroads with signs that read – “STOP LOOK and FOLLOW.” Remember it is very important to **“See & Be Seen.”**

During drilling, loading and blasting some roads may be barricaded with signs, traffic cones or other means to prevent access to the area. This is done to prevent access to a blasting area before, during and after a shot. Never enter these barricaded areas.

Mine Haulroad Safety Rules

- 1) Obey all posted speed limits.
- 2) Obey all posted warning, advisory, and traffic signs.
- 3) Always wear seatbelts.
- 4) Drive with your headlights on.
- 5) Adjust your speed for weather conditions.
- 6) Loaded haul trucks have the right of way.
- 7) Never enter areas that have been barricaded.
- 8) **Do Not Pass** any mobile equipment or vehicles unless you have received clearance (by radio/hand signals) from the operator of that piece of equipment.
- 9) Be alert for material that may fall from the bed of loaded haul trucks. Keep plenty of space between you and a haul truck when following up any grades.
- 10) Give plenty of clearance to all mobile equipment. These large pieces of equipment have very limited visibility and large blind spots.
- 11) When following a haul truck, stay far enough back that you can see the driver's side mirror, that way the operator can see you.
- 12) Never enter marked or barricaded blasting areas.
- 13) Never park directly behind any mobile equipment. Always park on the driver's side. If you cannot see the operator, the operator cannot see you.
- 14) Pay attention to horns, alarms, and signals from mobile equipment.
- 15) Never park on the haulroad. Always park in a spot that is clear from traffic. In case of a mechanical problem, park as far to the right as possible and turn on emergency flashers.

GENERAL REQUIREMENTS:

- All visitors planning to drive on any haul roads shall successfully complete a specific hazard awareness training session presented by Degerstrom Ventures.
- All visitors on any haul road shall obtain Degerstrom Ventures permission for access.
- All visitors must check in and out at the Degerstrom Ventures Office before and after each visit.
- Vehicles using haul roads shall not trip the traffic lights at the Conda or Ballard Crossings.
- Posted speed limits & traffic requirements shall be followed when using the haul roads.
- Seatbelts shall be worn at all times when using the haul roads.
- Vehicle headlights shall be used when traveling the haul roads.
- Ore haul trucks are considerably larger than regular semi trucks. It requires much longer distances to stop them and they are much less maneuverable.
- Never pass a haul truck traveling on the haul road.
- When approaching a haul truck stopped along the haul road – SLOW DOWN & SOUND HORN before passing.
- Be alert for wildlife and livestock that may be on, along or crossing the roadway.
- Leave all gates along the haulroads the way that you found them.

SPECIFIC REQUIREMENTS:

1. From the stacker dump station to the gravel pit, visitors can use the haul road if they have completed the general requirements.
2. From the gravel pit to the corrals by the Fish Pond, visitors must complete the general requirements and have an approved Monsanto or Degerstrom Ventures' escort at all times.
3. From the corrals by the Fish Pond to the Ballard light, visitors can use the haul road if they have completed the general requirements.
4. From the Ballard lights to the Degerstrom Ventures Office, visitors with business to complete at the mine can use the haul road by following the requirements of the road signs.
5. From the Degerstrom Ventures Office to the tipple and mine, visitors must have a Monsanto or Degerstrom Ventures' escort or complete the general requirements plus obtain Degerstrom Ventures permission.

Degerstrom Ventures haul trucks, equipment and other vehicles shall always have the right-of-way and all vehicles shall yield to them. Visitors shall travel at their own risk. Degerstrom Ventures shall not be held responsible for their safety.

USE OF THE HAUL ROAD IS A PRIVILEGE GRANTED BY DEGERSTROM VENTURES. ANY VIOLATIONS OF THIS POLICY WILL RESULT IN REMOVAL FROM THE PROPERTY

RELEASE FORM (Individual)

In consideration of the permission given to me by DEGERSTROM VENTURES and/or MONSANTO/P4 PRODUCTION, L.L.C. to enter upon land owned or leased by DEGERSTROM VENTURES for the sole and exclusive purpose of _____, I, the undersigned, do hereby:

- (i) Voluntarily assume all risk, whether known or unknown, of accident, loss and damage to myself and others and property resulting or arising from or in any way connected with my presence on said land;
- (ii) Release and discharge DEGERSTROM VENTURES and MONSANTO/P4 PRODUCTION, L.L.C., and its successors and assignees, and its and their respective directors, officers, employees, and agents, from any and all claims, obligations, liabilities, losses, damages, costs, or expenses of any kind, (including, without limitation, attorney's fees), whether known or unknown, sustained as a result of or arising from or in any way connected with my presence on said land; and
- (iii) Agree to protect, indemnify, and save harmless DEGERSTROM VENTURES and MONSANTO.P4 PRODUCTION, L.L.C., their successors and assignees, and its and their respective directors, officers, employees, and agents, from any and all claims, demands, causes of action, losses, damages, obligations, liabilities, penalties, costs, and expenses of any kind (including, without limitation, amounts paid in settlement and attorney's fees and expenses), whether known or unknown, suffered by, imposed upon, incurred by, asserted against, or arising in any way against, DEGERSTROM VENTURES and MONSANTO/P4 PRODUCTION, L.L.C. or any of their successors or assignees, or the directors, officers, employees, or agents of any of them in connection with my presence on said land regardless of whether caused by the negligence of DEGERSTROM VENTURES and MONSANTO/P4 PRODUCTION, L.L.C. or their directors, officers, employees, or agents.

IN WITNESS WHEREOF, I hereunto set my hand this _____ day of _____, 200_.

Address: _____

APPENDIX J

OSHA JOB SAFETY AND HEALTH PROTECTION POSTER

JOB SAFETY & HEALTH PROTECTION

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers by promoting safe and healthful working conditions throughout the Nation. Provisions of the Act include the following:

Employers

All employers must furnish to employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to employees. Employers must comply with occupational safety and health standards issued under the Act.

Employees

Employees must comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to their own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct jobsite inspections to help ensure compliance with the Act.

Inspection

The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaint

Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or for otherwise exercising their rights under the Act.

Employees who believe they have been discriminated against may file a complaint with their nearest OSHA office within 30 days of the alleged discriminatory action.

Citation

If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty

The Act provides for mandatory civil penalties against employers of up to \$7,000 for each serious violation and for optional penalties of up to \$7,000 for each nonserious violation. Penalties of up to \$7,000 per day may be proposed for failure to correct violations within the proposed time period and for each day the violation continues beyond the prescribed abatement date. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to \$70,000 for each such violation. A minimum penalty of \$5,000 may be imposed for each willful violation. A violation of posting requirements can bring a penalty of up to \$7,000.

There are also provisions for criminal penalties. Any willful violation resulting in the death of any employee, upon conviction, is punishable by a fine of up to \$250,000 (or \$500,000 if the employer is a corporation), or by imprisonment for up to six months, or both. A second conviction of an employer doubles the possible term of imprisonment. Falsifying records, reports, or applications is punishable by a fine of \$10,000 or up to six months in jail or both.

Voluntary Activity

While providing penalties for violations, the Act also encourages efforts by labor and management, before an OSHA inspection, to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries. OSHA's Voluntary Protection Programs recognize outstanding efforts of this nature.

OSHA has published Safety and Health Program Management Guidelines to assist employers in establishing or perfecting programs to prevent or control employee exposure to workplace hazards. There are many public and private organizations that can provide information and assistance in this effort, if requested. Also, your local OSHA office can provide considerable help and advice on solving safety and health problems or can refer you to other sources for help such as training.

Consultation

Free assistance in identifying and correcting hazards and in improving safety and health management is available to employers, without citation or penalty, through OSHA-supported programs in each State. These programs are usually administered by the State Labor or Health department or a State university.

Posting Instructions

Employers in States operating OSHA approved State Plans should obtain and post the State's equivalent poster.


Under provisions of Title 29, Code of Federal Regulations, Part 1903.2(a)(1) employers must post this notice (or facsimile) in a conspicuous place where notices to employees are customarily posted.

More Information

Additional information and copies of the Act, OSHA safety and health standards, and other applicable regulations may be obtained from your employer or from the nearest OSHA Regional Office in the following locations:

Atlanta, GA	(404) 562-2300
Boston, MA	(617) 565-9860
Chicago, IL	(312) 353-2220
Dallas, TX	(214) 767-4731
Denver, CO	(303) 844-1600
Kansas City, MO	(816) 426-5861
New York, NY	(212) 337-2378
Philadelphia, PA	(215) 596-1201
San Francisco, CA	(415) 975-4310
Seattle, WA	(206) 553-5930

Washington, DC
1997 (Reprinted)
OSHA 2203


Alexis M. Herman, Secretary of Labor

U.S. Department of Labor
Occupational Safety and Health Administration



This information will be made available to sensory impaired individuals upon request.
Voice phone: (202) 219-8615, TDD message referral phone: 1-800-326-2577

APPENDIX K

OCCUPATIONAL INCIDENT REPORT FORMS AND PROCEDURES

I. PURPOSE

To set forth the essential components and responsibilities for implementation of the MWH accident investigation procedure. Accidents are investigated to identify unsafe conditions and acts which contribute to injury, illness, and/or property damage so that solutions for accident prevention may be developed.

II. ATTACHMENTS

Incident Reporting Process flowchart
MWH Occupational Incident Report Form (OIR)
Vehicle Accident Report Form (VAR)

III. DISCUSSION

Effective accident investigations lead to procedures which can reduce or eliminate occupational injuries and illnesses. It is important for MWH management and employees to understand and comply with the accident investigation procedures.

IV. DEFINITIONS

Accident/Incident: is an occurrence in a sequence of events that usually produces unintended injury or illness, or death, and/or property damage.

First Aid: is any one-time treatment and any follow up visit for the purpose of observation of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care, but may be administered by a physician.

Near-Miss Situations: are accidents without injury, illness or property damage, but have the potential for serious harm.

V. PROCEDURE**A. GENERAL**

Every accident/incident, regardless of whether it results in injury, property damage, or a near miss, should be investigated to determine the actual cause and to take proper action to prevent recurrence. The attached flow chart presents a schematic representation of the incident reporting process.

It is the responsibility of the Business Unit Manager to assure that a thorough investigation into the cause of each employee injury occurs immediately after the event, and to initiate corrective action to prevent a similar recurrence.

The Business Unit Manager must ensure that accidents/incidents are reported to the company health and safety manager to comply with the Occupational Safety and Health Administration (OSHA) recordkeeping/reporting requirements for

occupational injuries and illnesses (see MWH Safety and Health Policies No. 403).

It should be noted that incidents resulting in a fatality or the hospitalization of 4 or more people must be reported to the local OSHA office within 8 hours of the incident. It is preferable for the company health and safety manager to place the report with OSHA, however, if the health and safety manager is not available, the most senior MWH person at the scene of the incident shall make the report. Contact the local telephone information service to obtain the OSHA phone number.

B. ACCIDENT/INCIDENT INVESTIGATIONS

Once an accident occurs (whether it involves personal injury or illness, property damage or is a near miss), whether the victim is a MWH employee, contractor, or visitor, the below listed procedures are to be carried out.

1. Attend to the victim's medical needs.
2. Secure the accident/incident area.
3. Complete the MWH Occupational Incident Report Form.
4. Assemble the personnel and tools needed to perform an accident investigation.
5. Call the Health and Safety Coordinator or Health and Safety Manager **immediately** after the scene is secure, to report the accident and to initiate workers compensation coverage, if needed.
6. Begin the accident investigation.

C. MWH OCCUPATIONAL INCIDENT REPORT FORM

The MWH Occupational Incident Report Form (OIR), Attachment A, shall be completed by the designated MWH employee representative after an employee injury occurs. Each section of the report should be addressed and completed or marked "na" for not applicable. The degree of detail in the report and any additional data should be commensurate with the degree of the incident. That is, the report should be simple and concise for a twisted ankle resulting from someone tripping out of a van. The report should be detailed with additional background for a near miss that resulted from a pressure grout packer being expelled from a well which could have caused a fatality.

If the incident was involving a vehicle, private, company owned/leased, or rented, or other, the attached Vehicle Accident Report Form (VAR) should be completed.

Note: Forms that provide essentially the same information may be used in lieu of the MWH form. Regardless of which form is used, the distribution stated on the MWH form must be used.

The OIR and VAR shall be promptly submitted to the Health & Safety Coordinator and to the Company Health & Safety Manager.

D. ACCIDENT INVESTIGATION REPORT FORMAT

The various sections of the OIR are intended to clearly identify the incident, describe its cause(s), and insure that information is gathered that can be used to prevent recurrence, either for this particular instance, or similar situations. While the OIIR is basically self-explanatory, it is important that the persons completing and reviewing the form observe the following:

1. Do not speculate as to the facts, nor make unsubstantiated accusations. We all, however, are free to make reasonable assumptions based on a good faith understanding of the facts at hand. Remember that this form becomes an official, MWH legal document.
2. Handle any samples or physical evidence with care, insuring against even inadvertent tampering.
3. Keep all handwritten notes used in gathering the facts of the case in the office master file, along with the completed OIR. Raw data and notes may be helpful in a possible future evaluation.

E. RECORDKEEPING

Insure prompt distribution of complete OIR, i.e. within 24 hours, to:

1. Company Health & Safety Manager
2. The Local Health and Safety Coordinator
3. The Business Unit Manager or Program Director
4. The Direct Supervisor of the affected employee or project

VI. REFERENCES

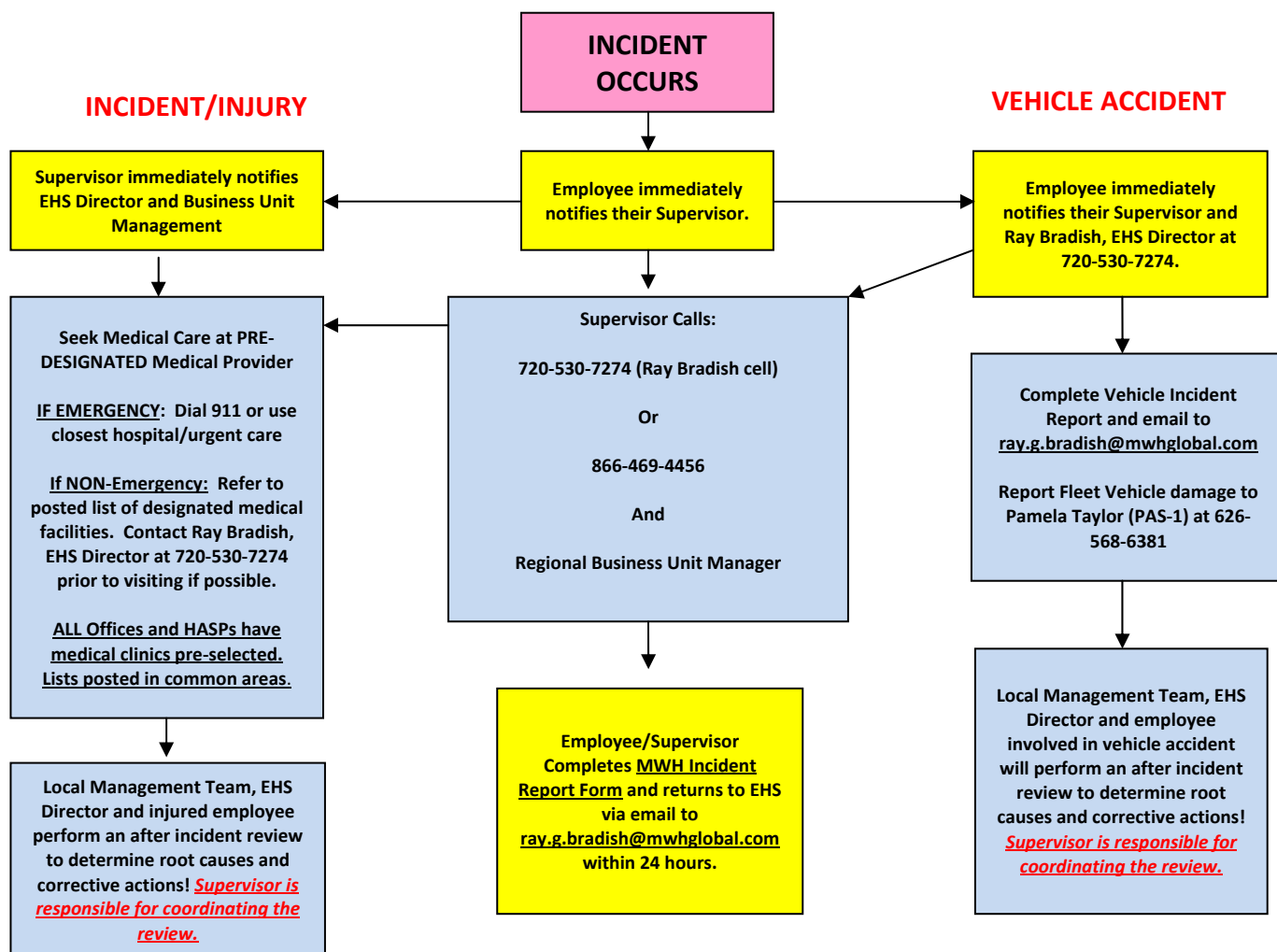
- A. Title 29, Code of Federal Regulations, Part 1904
- B. Various States' Labor, Health and Safety, and Workers' Compensation Codes

Incident Reporting Process Work-Related Injury / Illness or Vehicle Accident

1. Employee(s) should seek necessary medical attention as appropriate:
 - a. On-site first aid
 - b. Local clinic or Emergency room – e.g., identified in safety plan
 - c. Via 911 – transport by ambulance if there is any uncertainty about severity of injury

If work related, inform medical personnel this is a work-related incident. ***If the medical provider asks for a claim number, advise them that Travelers Insurance is your workers' compensation insurance carrier and your policy number is 5643B095.*** Any concerns related to ensuring paperwork/billing is managed can be resolved by contacting Carol Brammell, Travelers Claim Account Executive at 602-861-8737 or 602-803-8597. cbrammell@travelers.com

2. MWH Employee(s) should immediately notify their supervisor. The MWH employee or supervisor should then contact Ray Bradish, EHS Director at (b) (6) (cell) and their respective Business Unit Manager. Additionally, employees can utilize (866-469-4456) to report injuries or emergencies.
3. The MWH Occupational Incident and/or Vehicle Accident Report must be completed within 24 hours, preferably ASAP. Submit forms via email to Ray Bradish at ray.g.bradish@mwhglobal.com
4. Ensure that any client or state-specific forms and notifications are complete.



Occupational Incident Report Form

Page 1 of 2

EMPLOYEE INFORMATION (Electronically, double click on the box, click "checked")

Employee Name

OFFICE ADDRESS	OFFICE PHONE	HOME ADDRESS	HOME PHONE
----------------	--------------	--------------	------------

MWH EMPLOYEE (If not MWH employee, provide company name, address, phone) ☐ YES ☐ NO

BUSINESS UNIT

JOB TITLE	HIRE DATE	BIRTHDATE	SOCIAL SECURITY NO.	GENDER <input type="checkbox"/> M <input type="checkbox"/> F
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SUBCONTRACTOR INVOLVED (If yes, provide company, address & phone)

☐ YES ☐ NO

INCIDENT INFORMATION

LOCATION (name of facility or location identification, address, specific site)

DATE and TIME INCIDENT OCCURRED

EMPLOYEE'S WORK SCHEDULE ON DATE OF INCIDENT

TYPE OF INCIDENT:

<input type="checkbox"/> INJURY	<input type="checkbox"/> ILLNESS
<input type="checkbox"/> PROPERTY DAMAGE	<input type="checkbox"/> NEAR MISS
<input type="checkbox"/> OTHER INCIDENT	

What was the employee doing just before the incident occurred? Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. Examples: *climbing a ladder while carrying roofing materials; daily computer key entry*

What happened? Tell us how the injury occurred. Examples: *when ladder slipped on wet floor, worker fell 4 feet; worker developed soreness in wrist over time.*

What was the injury or illness? Tell what part of the body was affected and how it was affected. Be more specific than "hurt", "pain" or "sore". Examples: *strained back, carpal tunnel syndrome*

What object or substance directly harmed the employee? Example: *concrete floor; radial arm saw*

INJURY / ILLNESS TREATMENT INFORMATION

INJURY/ILLNESS TREATMENT:

<input type="checkbox"/> NOT APPLICABLE	<input type="checkbox"/> ON-SITE FIRST AID
<input type="checkbox"/> OFFERED & REFUSED	
<input type="checkbox"/> OFF-SITE (If checked, list name of physician or other health care professional/facility, address & phone)	

Was employee treated in an emergency room? ☐ YES ☐ NO

Was employee hospitalized as an in-patient? ☐ YES ☐ NO

Was this a fatality? ☐ YES ☐ NO

WITNESS STATEMENTS ATTACHED: ☐ YES ☐ NO

Witness Names:

Occupational Incident Report Form

Page 2 of 2

ANALYSIS OF CAUSES AND CORRECTIVE ACTIONS

WHAT CONDITIONS OR ACTIONS CAUSED OR CONTRIBUTED TO THE INCIDENT?

CORRECTIVE ACTIONS TAKEN OR RECOMMENDED (Describe):

DISTRIBUTION

(Supervisor and Business Unit Manager Print & sign name; Original is forwarded to EHS (DEN-2) Ray Bradish or Brenda Zimmerman)

What happened? Tell us how the injury occurred. Examples: *when ladders tipped on wet floor, worker fell 4 feet; worker developed soreness in wrist over time.*

1. EMPLOYEE or INDIVIDUAL REPORTED BY:

2. EMPLOYEE'S DIRECT SUPERVISOR:

3. BUSINESS UNIT MANAGER:

4. HEALTH AND SAFETY DIRECTOR:

Ray Bradish DEN-2
 Telephone: 303-533-1964
 Cell & Emergency: (b) (6)
 Facsimile: 303-410-4150

Email: ray.g.bradish@mwhglobal.com

OSHA Log Case Number: _____

Note: Attach additional sheets as necessary to document incident.

VEHICLE ACCIDENT REPORT FORM

MWH DRIVER INFORMATION

Your Name:		<input type="checkbox"/> Leased (US Fleet Leasing Vehicle Number)
Office Address		<input type="checkbox"/> Rented <input type="checkbox"/> Company Owned <input type="checkbox"/> Other
City		Year/Make/Model
State	Zip	Age
Work Phone		Business Unit
Is Your Vehicle Drivable?		
List Parts Damaged		

MWH DRIVER'S INFORMATION

Driver's Name	
Home Address	
City	
State	Zip
Home Phone	

OTHER VEHICLE OWNER'S INFORMATION

Owner's Name	
Street	
City	
State	Zip
License Plate Number	

WITNESSES

Name	
Home Address	
City	
State	Zip
Home Phone	

OTHER VEHICLE OWNER'S INSURANCE

Insurance Company	
Address	
City	
State	Zip
Policy Number	Phone

INJURIES

Were you injured?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Any Passengers Injured?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Was the Other Party Injured?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Any Of Their Passengers Injured?	<input type="checkbox"/> Yes <input type="checkbox"/> No

TYPE OF ACCIDENT

Collision With: <input type="checkbox"/> Other Vehicle <input type="checkbox"/> Animal <input type="checkbox"/> Fixed Object <input type="checkbox"/> Pedestrian <input type="checkbox"/> Ran off Road <input type="checkbox"/> Hit and Run <input type="checkbox"/> Other (Non Hit and Run)	Manner of Collision: <input type="checkbox"/> Backing <input type="checkbox"/> Head-on <input type="checkbox"/> Side Swipe <input type="checkbox"/> Angle <input type="checkbox"/> Read-End (We Hit)
---	--

STATEMENT OF FACTS

Accident Date _____		Purpose of Trip (circle one) Business Pleasure	
Accident Location Street _____		Urban or Rural Area _____	
City _____	State _____	Zip _____	
Was a Police Report Made? <input type="checkbox"/> At Scene <input type="checkbox"/> At Station <input type="checkbox"/> None Report Number _____			
Road Conditions <input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> Mud <input type="checkbox"/> Snow <input type="checkbox"/> Ice <input type="checkbox"/> Cinders <input type="checkbox"/> Other			

SPEED OF VEHICLES

Your Vehicle	Other Vehicle
Before Accident _____	Before Accident _____
At Impact _____	At Impact _____

CITATIONS

Was a Citation Issued? _____
To Whom? _____
Nature of Charge _____

DRIVER OF VEHICLE (Other Than Assigned Under Lease)

Driver's Name _____		
Street _____		
City _____	State _____	Zip _____
Relationship to Employee _____		

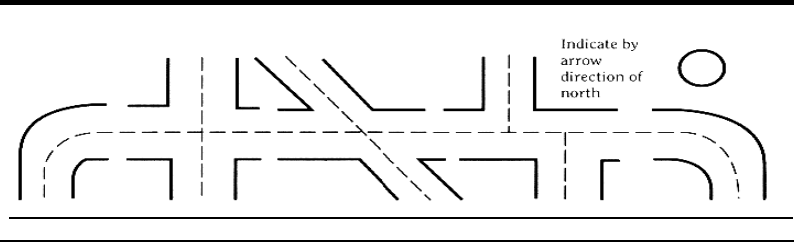
MAIL OR FAX THIS REPORT TO

Ray Bradish, EH&S Director – DEN-2
Phone: (303) 533-1964
Cell: (b) (6)
Fax: (303) 410-4150
Email: SM-AccidentReporting@mwhglobal.com
Brenda Zimmerman
Phone: (303) 533-1967
Fax: (303) 410-4150

DESCRIBE WHAT HAPPENED (Be Specific. Attach Additional Sheets if Necessary)

Signature _____	Date _____

ACCIDENT DIAGRAM

	<p>Diagram Please draw what happened. Include signals and number the vehicles. #1 for your vehicle, #2 for the other vehicle, etc.</p> <p>Directions Use solid line to show path of vehicle before accident, dotted line after accident.</p>
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